The Week In Engineering and Construction

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War needs for material and labor may force housing cut

WPB faces possibility of sharply restricting war housing. Enforced use of low standards might cause elimination of private capital from housing program.

The possibility of sharply restricting the present program of building houses for war workers is now being considered seriously by the War Production Board. Demands of the army and the munitions industries for materials and manpower are increasing so much faster than was contemplated even a month or so ago that a distinct doubt now exists as to whether these demands can be reconciled with a housing program on the scale of that now under way.

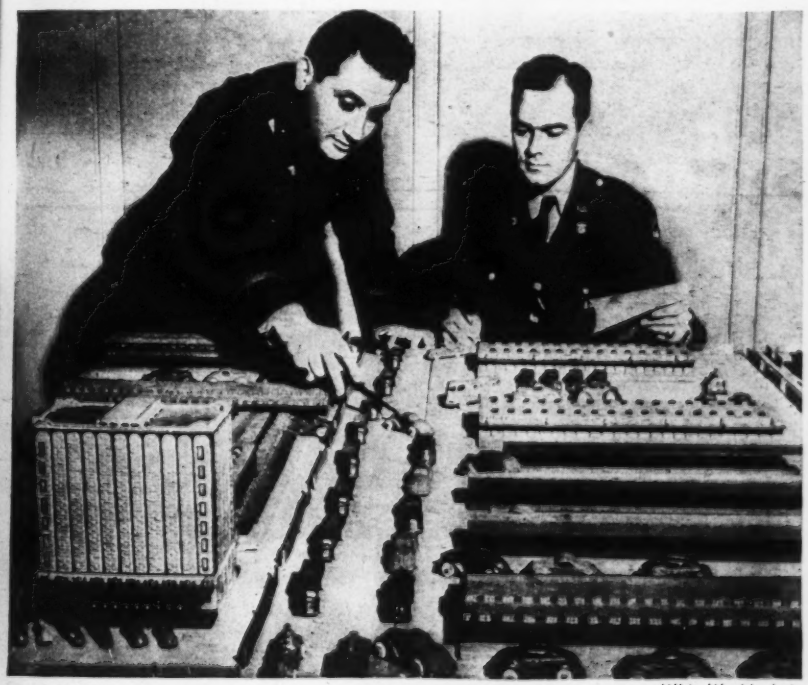
There is no immediate prospect that war housing will be abandoned since it is recognized that housing for war production workers is essential to production. But it is quite likely that allocations of critical materials—particularly metals—will be cut down to a level that will require reduction of standards of housing well below those now considered minimum.

Later in the year, even such substandard housing may be pared down, if a labor shortage develops as a result of the pressure exerted by this year's huge construction program and the increasing military demand for men.

The immediate issue, however, is materials, and the question of what to do about them is now up before WPB's Requirements Committee. This committee is a body named by Donald Nelson to reconcile the conflicting materials demands of different phases of the war program. Last March the body approved an allocation of material for construction of 300,000 houses—100,000 publicly financed and the rest privately. It is now reconsidering that allocation, and a decision is expected within a few weeks.

The issue came before the committee from two directions. On the one hand, various groups in WPB have been complaining of the use in housing of materials urgently needed for other purposes. And on the other hand, WPB's housing priority section is finding it impossible, with the priority ratings available to it, to get delivery on many needed items—such things as copper wiring, nails, reinforcing steel.

If the committee's decision is to push housing standards down to a very low level, an immediate effect will be the elimination of private participation in the war housing program. Private capital, it is apparent, will have no interest in building what amount to shacks for purely wartime occupancy.



Wide World photo

Model aids traffic control study at Army depot

To speed and simplify the solution of intricate traffic control problems at Army depots, the motor transport division of the Office of the Quartermaster General is using scale models similar to those used for advance studies of warehouse design and layout.

Lieut. A. J. Swiren (left) and Lieut. E. P. Hogan here use such a model to work out traffic regulation problems to speed up vehicle movements and eliminate possibility of costly accidents. The model provides a quick, visible and maneuverable "working drawing."

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OPA price freezing order seen omitting profession

Operations of engineers and contractors are not greatly affected by the order issued this week by the Office of Price Administration freezing the prices of most goods and services. The order specifically exempts "professional services" from the freeze, and also "services relating solely to real property." The first exemption would clearly exempt engineering fees. The second exemption almost certainly would eliminate the price of most construction from the order.

Effect, therefore, of "the general maximum price regulation" is that the price of materials and equipment contractors and engineers buy, insofar as they are not already under OPA ceilings, is frozen at the highest price charged by the supplier in March. The new order freezes

manufacturers' wholesale and retail price of all goods and services except those already regulated or those specifically exempted in the order. Goods exempted by the order are mostly unprocessed agricultural commodities and certain foods. Of interest to construction is the exemption of the price of used automobiles and of the sale "by any merchant, farmer, artisan, or person who renders professional services, of his used supplies, or business or professional equipment." Among the exempt services are services of an employee to his employer, services of a common carrier or public utility, insurance and underwriting services.

For every seller, the ceiling price is the highest price he charged for the same goods and services to an industrial consumer and is effective May 11. Retail sales of goods comes under regulation May 18, and retail services July 1.

WASHINGTON HIGHLIGHTS

EQUIPMENT manufacturers have been asked by the Corps of Engineers to cooperate in an arrangement (*ENR*, April 23, p. 56) by which their distributors will regularly inspect the equipment of Army contractors in their neighborhood —thus keeping it in good shape without the necessity of the contractor maintaining large stocks of replacement parts.

FEDERAL regulation of vehicle weights and sizes would be permitted during the war period under a bill introduced by Senator Andrews.

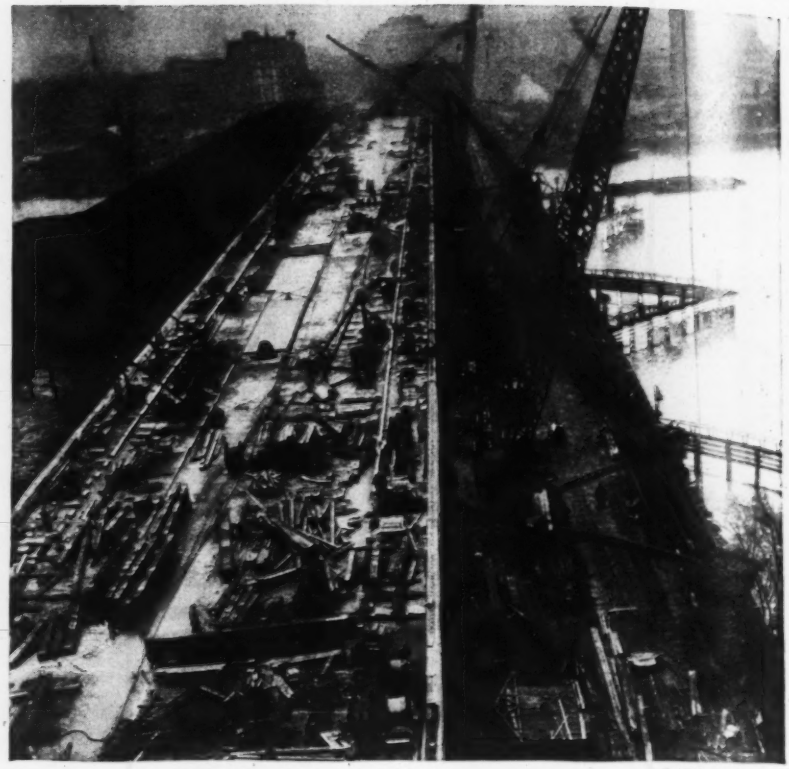
THE War Department Civil Functions Appropriation, a $343,939,000 measure, was passed by Congress last week. In its final form the bill included no money for the Table Rock and Bull Shoals Dams in the White River basin in the state of Arkansas.

POSSIBILITY that the Work Projects Administration may be abolished soon is currently rumored in Washington.

A $500,000,000 increase in FHA's authority to insure Title VI mortgage loans has been approved by the House. The existing $300,000,000 authority has been exhausted. Title VI loans are made on easy terms involving practically no down payment for housing in defense areas costing less than $4,000.

WHEN housebuilders who have priority ratings use the rating to buy goods from a supplier, the supplier may wait as much as three months before extending the rating to replenish his inventory. The War Production Board so provided last week in amendments to orders P-55, P-19-c, and P-19-d. Previously the supplier had to extend the rating before its expiration date.

DISTRIBUTION of used rail, whether of relaying, reroll, or scrap grade, is now subject to WPB allocation. Order L-88 forbids anyone from selling such rail without express permission. Anyone buying new rail for replacement purposes is required to set aside for allocation used rail equivalent to 15 percent of the new footage within 30 days after receipt of the new rail, 15 percent more within 60 days, 20 percent in 90 days, and another 40 percent within 150 days.



British Combine photo

Work continues on Waterloo Bridge

Construction work on the new Waterloo Bridge over the Thames River in London, England, is continuing slowly despite the war. It is now hoped that the bridge can be opened to traffic this fall. The deck of the new bridge is shown in the left center, with the construction trestle at the right and the temporary bridge at the far left.

Demolition of the old bridge was begun in 1935 (ENR Sept. 3, 1936, p. 334) and construction of the new bridge started in 1937. It consists of five twin arches of 238-ft. span, of reinforced concrete faced with Portland stone. Piers are of granite-faced concrete. The bridge deck is 80 ft. wide, providing space for six lanes of traffic, a median strip, and two 11-ft. sidewalks. The old bridge, built in 1811-17, had a roadway width of only 27 ft. 6 in.

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Wentzville labor dispute ends in decision for AFL

The AFL-CIO dispute over erection of pre-fabricated houses for the Farm Security Administration housing project at Wentzville, Mo. (*ENR*, April 23, p. 596), ended last week when the erection contractor, J. M. Jack of Kansas City, Mo., decided to do the work with AFL labor. The dispute, which involved the "AFL monopoly" feature of the construction labor stabilization agreement, had looked as if it were going to become another test of the stabilization agreement, like the Currier case of last year.

The contractor's swing to AFL made unnecessary the negotiations under way in St. Louis last week among the AFL building trades council there, representatives of the War Production Board, and representatives of the Federation itself (CIO representatives failed to appear for the conference). A feature of the negotiations, however, was the first official public admission that the stabilization agreement does in fact require the use of AFL labor. John L. Kinsella, a consultant for the WPB labor division said that, under the agreement, the job should never have been awarded to a CIO contractor.

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Iron and steel use due for restriction under expected WPB conservation order

Order due in few days will prohibit use of metals in manufacture of 360 items, excepting those for use by the Army, Navy and Merchant Marine.

Use of iron and steel will be eliminated from a good many familiar applications with the issuance—expected in a few days—of a new WPB conservation order. Effective about a month and a half after issuance, the order will forbid use of iron and steel in the manufacture of some 360 items. The prohibition will apply except on goods ordered by the Army, Navy, or Maritime Commission.

In addition to a great many types of hardware, the forbidden list will include the following items of particular interest to the construction industry: bleachers and grandstands, culverts except at airports, curb guards, fence and fence posts except on A-2 or better ratings, grain storage bins, sewer gratings except on A-2, lighting poles and standards, scaffolding, sewer pipe more than 5 ft. from buildings, structural steel homes, wheelbarrows except the wheels.

This week, meanwhile, the Army and Navy Munitions Board imposed strict controls on materials used on Army and Navy construction projects. It issued a memorandum forbidding or limiting the use of 28 critical materials.

Flatly forbidden by the munitions board order is the use of: aluminum, cadmium, magnesium, manila, mercury, monel metal, nickel, silk, sisal, tung oil, and vanadium. The other items that are prohibited except for specified purposes or in specified conditions include asbestos, chromium, copper, cork, freon, gas, hemp, jute, lead, rubber, steel and iron, tin, zinc. Structural steel is only permitted for spans over 60 ft. and water towers more than 50 ft. high.

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St. Louis water utility sold to Illinois group

The Northern Illinois Water Corp., of Chicago, has purchased the stock and properties of the St. Louis County (Mo.) Water Co., in a deal consummated last week at a cost of $3,260,000.

The St. Louis company was owned by the Commonwealth Utilities Corp., a subsidiary of the United Gas Improvement Co., Philadelphia, which was ordered to sell its Missouri holding under the Federal Holding Company Act.

Low bid on third Panama locks is $81,849,376

A low bid of $81,849,376 for the construction of a third set of locks at Pedro Miguel and Miraflores on the Panama Canal, has been submitted to the War Department.

The bid, one of two submitted, was made by the Pan Construction & Materials Corp., which is made up of eight individual construction companies. The second bid, for $82,982,645, was submitted by Panama Constructors, Inc.

According to Col. Hans Kramer, supervising engineer of the special engineering division of the canal, the low bidder set a price of $10.40 a cu.yd. for the bulk of the concrete work.

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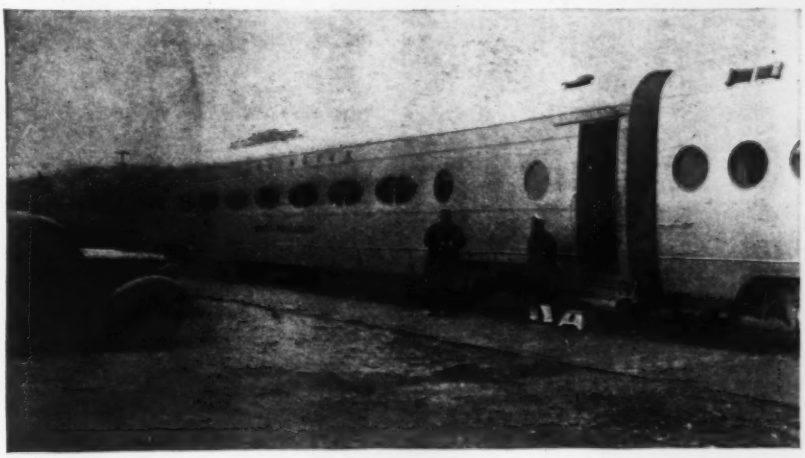
British plan changes in brick specifications

Compulsory closing of many brick plants, a reduction in the output, and introduction of one standard size for common brick has been recommended to the British Minister of Works and Buildings, in a report on increased efficiency and economy in brick manufacture in Great Britain.

Dimensions of the proposed standard brick are $8\frac{3}{4}$ in. x $4\frac{3}{8}$ in., by $2\frac{5}{8}$ in., with $\frac{1}{8}$ in. tolerance in length and $\frac{1}{8}$ in. tolerance in other directions.



Pendulum suspension cars on trial run at Chicago

Engineers and railroad representatives were given a first-hand view of a new type pendulum suspension railroad passenger coach recently on a trial run from Chicago to Galesburg, Ill., and return. Three of the new type cars and one standard passenger coach and two light-weight streamline coaches made up a special train, pulled by diesel locomotives.

The new cars were built by the Pacific Railway Equipment Co., Los Angeles, for the Santa Fe, Burlington and Great Northern Railroads. Their principal feature is the spring mounting, consisting of eight vertical coil springs over each truck, four on each side, which support the car above the center of gravity. Side sway is checked and snubbed by vertical leaf springs and rubber buffers. The car bodies are of light-weight steel construction with steel stressed-skin walls. Interiors are finished in ultra-modern style.

The train was operated at various speeds up to 108 m.p.h. to show the riding qualities of the various types of cars. There was no question but what the pendulum type cars rode smoothest on tangent track, though on curves there was a perceptible side jerking as the snubbing spring came into action. This jerking broke up the sustained outward thrust experienced on the other type of cars in passing around curves at high speed.

Ralph Budd, president of the Burlington and E. J. Engel, president of the Santa Fe, were among those who made the trip.

MEN AT WORK

in and near the Nation's Capitol

R. E. LATIMER is moving the earth at the new Brighton Dam to supply added water for the Washington Suburban Sanitary District located at Hyattsville, Md.

HOWARD MAXTON, formerly cost engineer of the Tennessee Valley Authority is now in the cost and contract section of the Bureau of Yards and Docks of the Navy.

CAPT. R. R. FURMAN of the Corps of Engineers is in charge of some of the work on the huge War Department building under construction at Arlington, Va.

On an Ambursen Dam for The Washington Suburban Sanitary District, which supplies water to a large territory in Maryland surrounding the City of Washington, G. BONNETT, left, is office engineer; D. C. BROOKS, center is concrete placing inspector and JOS. C. COLLINSON is plant inspector.

Supplying more water for increased population in the Capitol area is the job of these employes of the Washington Suburban Sanitary District on an Ambursen type dam. Left to right are HUGH E. BOX, resident engineer; H. F. STUBBS, supervising engineer; and R. B. THOMAS, acting department engineer.

Changing the old Washington airport site into a 4,500,000 sq. ft. War Department office building in about a year is the present job of TOM MOORE, assistant general superintendent for John McShain, Inc. Doyle & Russel and Wise Contracting Co., contractors for the structure.

Equipment operation and maintenance has been a big part of the work of A. G. ARMSTRONG, chief engineer for Potts & Callahan who are moving 6,000 000 cu. yd. of earth to make the old Washington airport an accessible and beautiful site for the War Department Office Building.

On Temporary Buildings T3, 4 and 5 near the Washington Monument ELSTON A. LOTZ, left is construction engineer. CLYDE C. KEY, at right, is project engineer in general charge of this and two other temporary building jobs which are under rush construction by the Public Buildings Administration.

When this picture was made HENRY ALLAN was project manager for Charles H. Tompkins Co. on construction of the temporary "V" building in Washington, illustrated in this issue. Temporary buildings go up so fast he has probably moved on to other work now.

JOHN A. SCHEIBEL is superintendent and FRANCIS M. TOMPKINS is project manager for Chas. H. Tompkins Co., contractors on a new bridge near the Jefferson Memorial to alleviate congestion on an approach to the Highway Bridge over the Potomac River.

PAUL F. DAVIS is project manager for Potts & Callahan contractors for all of the earth moving for roads, landscaping, and utilities on the huge War Department Office Building in Arlington, Va. His office is in the administration building of the old airport which served the Capitol until a year ago.

A.S.C.E. meeting centers on civilian defense and war work of engineers

Progress in civil protection planning reported at two principal sessions of spring meeting of American Society of Civil Engineers. Division meetings considered subjects related to war.

A keynote for the spring meeting of the American Society of Civil Engineers was sounded by Charles B. Burdick, vice president, when he said that the war work of the individual members is the greatest contribution that the society as a whole can make toward the nation's war effort. This observation was prompted by his announcement that Ernest B. Black, president, would not be able to attend the meeting because of his preoccupation with a new war project. In like vein, at the meetings on civilian protection, emphasis was laid on the importance of individual members of the society taking the lead in their respective communities in such matters as provision for prompt restoration of essential services, water supply, power and transportation.

Originally scheduled to be held in New Orleans, the spring meeting was moved to Roanoke, Va., April 22-23, after war was declared and was reduced to a two-day program arranged by the headquarters staff to relieve any local section from responsibility of planning for a meeting under war conditions. Nevertheless, the Virginia Section, under the leadership of its president, Eugene S. Thomas, acted as host to the convention, put on trips for the ladies, and held a dinner meeting of the section at Hotel Roanoke on Tuesday evening to which the board of direction and delegates to the Local Sections Conference, held on Tuesday, were invited. Total registration, including delegates to the local section and student chapter conferences and the ladies was over 400.

The board of direction, at its meeting held on April 21, decided to hold the annual convention at the University of Minnesota, Minneapolis, Minn., during the week of July 19-25. Decision as to whether there will be a fall meeting will be made at that time.

Local sections conference

The first discussion of civilian protection took place on the Local Sections Conference, held in advance of the main meeting, at which twelve sections in South Atlantic and Gulf States were represented. Section activities in civil protection vary widely. Local groups were reported to have been able to render valuable service in such matters as surveys of school buildings to see that no hazardous buildings are used as shelters, selection of sites for emergency hospitals, to get adequate dispersion of hospital facilities in areas expected to be subject to bombing, and in the organization of protective activities for cities. In West Virginia, building surveys made in conjunction with architects have shown that many buildings selected as shelters by civil authorities should be rejected as unsafe. Plant protection also has been found to be a field where engineers can render valuable service.

Allen J. Saville, Richmond, urged that civil engineers concentrate on developing means for restoration of essential city service—water, sanitation, light, and transportation—rather than on such matters as air-raid shelters, as this is the field in which they can be of greatest service to their communities. He also urged engineers to be aggressive in getting cities interested in this part of their protection problem. Newspapers and local radio stations, he said, can be used effectively in such a campaign and will be glad to help.

E. P. Goodrich, chairman of the National Committee on Civilian Protection, called attention to the [illegible] work being done along this line in Chicago under the leadership of W. W. DeBerard, city engineer.

Plant and power protection

The symposium on civilian protection in war time, held Wednesday afternoon, was devoted in large part to protection of industrial plants and electric power facilities against sabotage. One paper was by Thomas R. Tate of the Federal Power Commission and the other by Robert H. Cunningham of the Federal Bureau of Investigation. For reasons not apparent in the text of these papers, publication of summaries was prohibited.

Pennsylvania's plans for evacuation of civilians from New Jersey to points 100 miles west of the Delaware River were outlined by Ray F. Riegelmeyer, traffic engineer of the Pennsylvania Department of Highways.

Returning to the subject of repair of utilities damaged by air attack, Allen J. Saville outlined how such repairs are handled in England. San Francisco, he said, is the only place in this country where a comparable system has been set up on a working basis. That system is a modification of one setup some years ago for use in case of an earthquake.

Model shows Chicago's public works defense

A model showing what action would be taken by Chicago's emergency public works engineering organization after an air raid, has been prepared by S. J. Michuda, engineer of bridges for the city and chief of the emergency organization, and placed on display in the foyer of the city hall.

Around the sides of a display case cards have been placed to explain the activities of the various squads shown on the model. On a bombed bridge and viaduct demolition squads are shown clearing up damage, while approaching the bridge in a floating derrick loaded with repair steel. At one point a bomb crater is shown surrounded by men cleaning up debris, while nearby a first-aid squad is in action. Another group is a decontamination squad flushing a street to clear it of a persistent gas, while flagmen prohibit the public from entering dangerous areas.

W. W. DeBerard, (left) city engineer, is shown above with Mr. Michuda.

Mild exception to this statement was taken by Ralph Mann, American Wood Preservers Assn., New York, who told in some detail of the carefully worked out system now in effect in Westchester County, New York.

Sanitary service protection

Samuel A. Greeley, consulting engineer, Chicago, gave the second progress report of sanitary and public health engineering division of the Committee on Civilian Protection in War Time at the Sanitary Engineering Division meeting on Thursday. (The first report was published the January, 1942, issue of *Proceedings*, A. S. C. E.). Elements that should be included in protective planning are: reinforcing the water-supply system by construction of new links, establishment of emergency supplies, emergency pumping installations, protective covers over important structures, splinter and blast protection for equipment of the sanitary services, protection of records, protection of food supplies, establishment of alternate methods of garbage collection, provision for handling sewage should disposal plants be put out of service, plans for emergency power supplies and protection of power and communications conduits.

Mr. Greeley said that the system set up at Chicago is one of the best in the country. Its program for handling water-main breaks is based on actual experience in the past, but the organization has been expanded so that eight major breaks could be handled simultaneously. Without identifying the places, Mr. Greeley reported on action taken by cities around the country. These include fastening down manhole covers to keep unauthorized persons from tampering with valves, construction of surface reservoirs and listing of swimming pools as point of supply in fire fighting, installation of supplementary pumping stations, putting old pumping plants back into working condition, construction of by-pass lines, arrangements for use of tank trucks for emergency distribution of drinking water, covering supply line manholes with earth to hide their location, making records of private well supplies for use in an emergency, and construction of underground gas-driven fire pumps. Numerous cities have acquired mobile chlorination equipment and a few have set up mobile sanitary laboratories.

National policy needed

Mr. Greeley urged establishment of a national policy with respect to protection of sanitary services to prevent wasteful use of critical materials. He pointed out that if every city went ahead with the purchase of pipe, valves and equipment to the extent that seemed desirable were all to be subjected to air attack the demand created thereby would have a serious effect on the nation's war effort if authorized by federal authorities. Mr. Greeley would have the government designate zones of potential air attack so that such materials as are available can be allocated to points where they are most likely to be required. Defense measures, he said, cannot win the war. Following up this thought, Mr. Goodrich said that the War Department considers a zone 300 miles in from the seaboard as vulnerable to air attack while Lloyd's insurance rates are higher only in a 100-mile zone, with Pacific Coast rates higher than for the Atlantic.

Methods for protecting dams against air attack were described in an illustrated talk by Joseph D. Lewin, assistant engineer, New York Board of Water Supply.

Protection in California

California's plans to minimize the effect of earthquakes have been a major factor in planning for protection against air attack, said Prof. Charles G. Hyde of the University of California. Cisterns built under the streets in San Francisco are available to fight fires caused by bombs. Prof Hyde endorsed Mr. Greeley's statement concerning the need for a national policy, stating that coast cities should get preference in building up pools of needed supplies and equipment.

H. G. Baity, professor of sanitary engineering at the University of North Carolina, in a discussion of plans in that state for protection of sanitary services, urged upon engineers their personal responsibility in educating local officials as to the importance of such work.

Water supply problems of the Hampton Roads area of Virginia were discussed by Reeves J. Newson, consulting engineer, New York, and Major G. E. McCallum, U. S. Public Health Service, pinch-hitting for M. O. Leighton, consulting engineer of Washington, told of how problems in the Washington metropolitan district are being met.

Airport pavement design

Problems raised by the high wheel loads of big bombing planes were considered in detail at the meeting of the soil mechanics and foundations division. William E. Barker, regional engineer of the Portland Cement Association, reviewed the development of formulas for the design of concrete pavements for highways and carried that line of reasoning forward to the development of formulas for airport use. Normal bombers have wheel loads of 40,000 to 47,000 lb., but static loads for big bombers now are up to 70,000 lb. What allowance should be made for impact is an open question; common practice has been to add 25 percent, but the Navy is now considering marking no allowance.

Design studies of the Portland Cement Association have been converted into charts to help simplify design work in

(*Continued on p. 10*)

Car travel on roads drops as controls tighten

State highway department checks throughout the nation show that increasing government restrictions on auto supplies and fuel are cutting deeply into pleasure car travel, H. S. Fairbank, Chief of the division of research, planning and information for the Public Roads Administration, told members of the Am.Soc. of C.E. at their Roanoke meeting.

During February of this year, Mr. Fairbank said, traffic on rural highways was 7.6 percent less than that of the same month a year earlier. General trends throughout the country point to a continued decrease, he added.

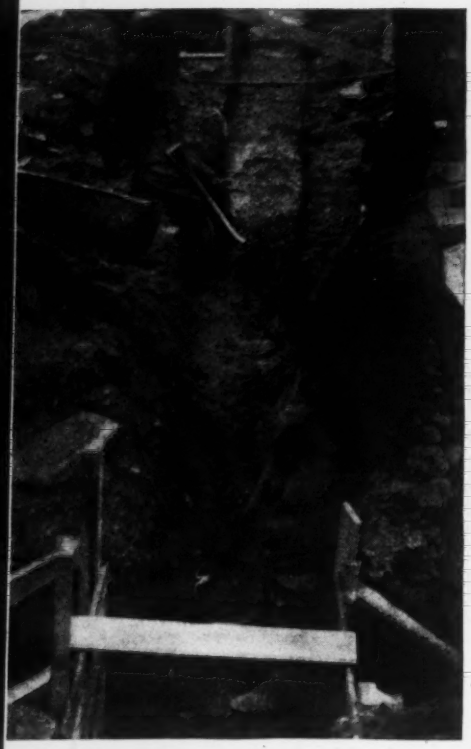
The decreasing use of highways presented many state highway departments with the problem of declining revenues, while it also eased the need for road construction work.

The Kentucky state highway department said it had already noted decreases in its income due to a rapid drop in bridge toll collections and gasoline taxes. Income for March, principally from taxes, dropped about $109,000 under last year. Bridge tolls dropped 14 percent.

Automatic traffic counters erected by the North Carolina Highway and Public Works Commission have revealed a statewide drop in traffic of 16.1 percent in March, 1942, as compared to the same month last year. Traffic counters on New York parkways also noted "considerable" decline in normal travel.

The Pennsylvania Turnpike Commission, in a recent financial report, noted that toll paying passenger cars, which in January were up 10 percent over the previous January, increased only 1 percent in February. Meanwhile, trucks and buses on the Pennsylvania superhighway increased 36 and 80 percent, respectively, in January, and 24 and 50 percent, respectively, in February. The commission estimated that the trucks are paying more than half of the tolls being collected on the Turnpike.

While the U. S. citizens still looked at dwindling operation of private cars, the transportation situation in Canada had become so serious that G. S. Gray, Transit Controller, announced that it will be necessary to eliminate bus services which duplicate rail lines, particularly those buses engaged in long hauls. Buses so released will be made available for augmenting local services.



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Washingto

Seventeen temporary office buildings have been completed and occupied and 12 more are under rush construction by the Public Buildings Administration in Washington, D. C. The number of Federal workers in the Washington area is now approaching 250,000 compared with 117,000 at the end of 1918 and 120,000 in 1938, making it necessary to provide additional office space at a rapid rate.

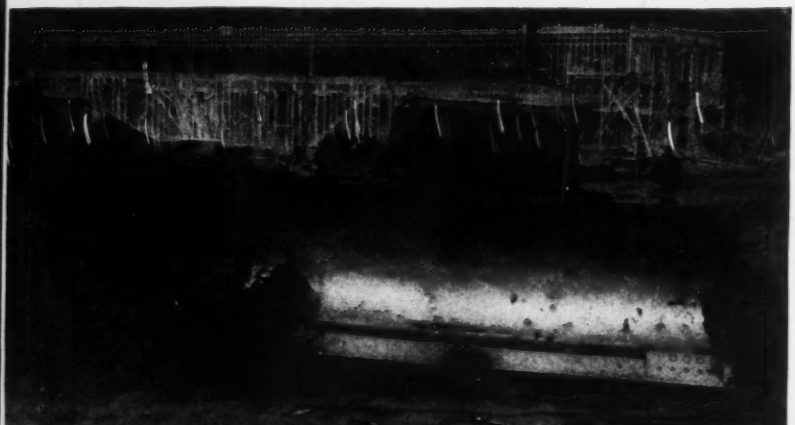
The buildings vary in size, but the average contains about 100,000 sq.ft. of floor area, requires 38 to 60 days to complete, and will provide office space for about 2,000 employees. Offices are laid out generally in a 16x16-ft. pattern with some variation in multiples of 8 ft. The 29 buildings, when completed, will provide a total floor area of more than 3,000,000 sq.ft. of usable space.

The buildings generally known as "Tempo A to Z (plus a few numbers as T2 to T7)" are being built with the expectation that they will be torn down immediately after the war emergency has passed. The structures are all two stories in height and of frame construction, covered with sheets of asbestos board. They follow a standard plan of a "head house" 47½ ft. wide facing the street with a varying number of wings, each 47½ ft. wide, extending to the desired depth. A 32½-ft. wide light-court separates the wings. The length of each building is determined by the size of the site, desired office space in the area.

Inexpensive foundations (above) are designed to conserve steel and be easily removed when the need for the temporary buildings is over. This illustration is on the "V" building site.

On the "V" building (right) bricks are laid at the rate of 1,000 or more per man per day to support the floor joists.

Repairs to equipment (below) are routine on many jobs. Temporary building T3 in background is under construction by McCloskey & Co. of Philadelphia.



Federal Works Agency photo

Taken a week apart, these pictures show the speed with which temporary office buildings are erected in Washington. This is Building "V" at Pennsylvania Ave. and 14th St. At the right are the Willard and Washington Hotels and the Post Office Building. This building will serve as information center for all those wanting direction on where to go and who to see in official Washington. Contractor for the structure is Chas. H. Tompkins Co. of Washington.

NSERVATION are Paramount on mporary Office Buildings

and the multiples of 47½-ft. wings plus 32½-ft. courts that can be placed on the assigned plot.

The foundations for the structures are designed for simple and rapid construction. Building loads are light so that in all structures built to date spread footings on the natural soil or even well consolidated fill have been satisfactory. Reinforcing is not used in the foundations or in the concrete exterior walls, and very sparingly in the longitudinal beam over interior footing columns. Foundations are often placed without forms. In one building brick interior walls are used in lieu of a beam where the height is moderate, thus saving time, forms and reinforcing. Concrete walls are only 6 in. thick, termite shields generally are not used, and protection against dry rot is employed on only two of the buildings. However, the buildings are well designed for their intended use and are expected to outlast the present emergency. The material is expected to have a good salvage value after its present use as the asbestos boards and lumber can be removed and reused.

On Tempo T3, 4, 5, and 6 buildings, flat band iron is used for form ties on foundation work where wall thicknesses vary and concrete is not exposed.

Organization speeds work

Door, window and similar frames are fabricated before delivery, but most of the other material is cut in job shops to supply the buildings under construction. Speed in construction can be attributed largely to the fact that the crews are well organized and move along as the building rises. Separate gangs of workmen complete one part of the work on a section or wing of the building and then move on to another area and repeat the same operation. A sufficient number of these buildings have been constructed in Washington so that an experienced crew can be secured as a nucleus and then expanded as the site opens up.

A typical example of speed in construction is completion of Tempo "A," "B" and "C" at 2nd St., between R and V Sts. SW., in 78 days. Contract time was 95 days and the total cost was about $3,000,000, a saving of about $560,000 on the estimated cost. The buildings contain a cafeteria and have a floor area of 672,700 sq.ft. net. The contractor on these buildings was Chas. H. Tompkins Co., of Washington.

Most of the buildings constructed during World War I, as temporary structures, were three stories high and of frame and stucco construction requiring 80 to 100 days to complete. Costs were somewhat less per square foot than for present-day construction, which might be attributed to a very much lower labor rate. More than 2,300,000 sq.ft. of space (exclusive of the Navy and Munitions building classed as temporary, but of concrete frame construction) was provided in 1917–18, two buildings of which are still in use at the present time.

Traffic dictates location

The program of temporary structures presents many problems not encountered 25 years ago. At that time metropolitan Washington's population was only one-third of the present figure of 1,000,000, the Mall was still in its formative stage, and there were few traffic difficulties. Today traffic has a definite influence on the location of these buildings, the plan being to decentralize them with the hope of improving traffic conditions rather than making it worse. All of the buildings are expected to be torn down as rapidly as the number of workers in Washington can be decreased after the present War.

(*Continued from p. 7*)

the field. These indicate that concrete pavements designed to meet present wheel loads will not be made obsolete by higher wheel loads due to the fact that tire pressures are not expected to be increased. Heavier planes of the future will simply have larger contact areas; possibly they will have added wheels to carry higher loads.

Feathering of the wheel tracks of a plane landing on a sandy beach was cited by E. P. Goodrich as indicating the lack of impact, but George E. Bertram, office of the Chief of Engineers, said that there is impact despite this evidence. He added that stresses developed by a plane taxiing downwind are higher than the impact stresses. In a paper on field bearing tests, Mr. Bertram described current methods of determining bearing values of soils and told of how results so obtained had been correlated to results obtained with heavy rubber-tired construction equipment. These show that the yield point of the soil needs to be set lower than the test on 30-in. diam. plates indicated. Deflections used in design formulas should be around 0.14 in. The War Department, in its testing, does not work with the subgrade in its worst condition as attempts to make tests on saturated soil were not satisfactory.

Prevost Hubbard, chemical engineer of the Asphalt Institute, endorsed the field tests described by Mr. Bertram as a rational approach to pavement design. Load supporting values of asphalt pavements are not good measures for comparison he said; the type of pavement and its critical deflection are more important. Mr. Hubbard laid special stress on the importance of uniform subgrade support for asphalt pavements. Like views were expressed by Capt. Van Sawin of Langley Field, Thomas E. Stanton, California Division of Highways supported Mr. Hubbard's views as to the importance of uniform subgrade support, but said that the California Division of Highways has found that where the deflection is above 0.02 or 0.04 in. the pavement will fail under repeated loading. He noted however, that greater deflection without detremental effect is possible under the wide tires of airplanes than under the narrow tires of trucks.

Military surveying

Difficulties raised by expansion of the Army's surveying needs were considered at a meeting of the surveying and mapping division. Lt. Col. Herbert B. Loper, Corps of Engineers, presented a paper on topographic mapping for defense and Capt. C. L. Garner of the U. S. Coast & Geodetic Survey discussed the contribution of control surveys to the war effort. For the benefit of the students who were present William N. Brown, Washington, chairman of the meeting, raised question as to where the need for young surveyors in the war effort is most critical. These questions were answered in part by J. G. Staack, U. S. Geological Survey, and by Colonel Loper.

Conservation of materials

Conservation of steel and substitute materials were subjects considered by the structural division during a session which developed information of essential value to the war effort as well as presenting technical data of interest to members of the division. In his introductory remarks, Prof. J. M. Garrelts, secretary of the division, indicated that the presentations were concerned entirely with problems of availability of material and were not to be considered in the light of economy of design or engineering endorsements of procedure suggested under present conditions.

A paper of fundamental interest by Shortridge Hardesty, consulting engineer, reviewed the subject of allowable unit stresses in structural carbon steel for bridges and buildings. Using the "rating stresses" of both the A.R.E.A. and the A.A.S.H.O. as a guide, Mr. Hardesty developed ratios of working stresses to yield points (33,000 psi.) which indicated figures of 20,000 psi. (lateral and longitudinal forces omitted) for general design use and 22,000 psi. in special designs; these figures correspond to 18,000 psi. under current specifications for bridges. Based on a parallel study, his paper developed working stresses of 22,500 psi. for general designs and 24,000 psi. for special designs in the field of building construction, as compared to the figure of 20,000 psi. The paper concluded with a caution concerning fatigue stresses in structures where reversals of stress are frequent.

In discussion, F. H. Frankland, director of engineering, American Institute of Steel Construction, stated that many old steel bridges confirmed the use of "rating capacity" with a factor of 0.8 of the yield point as satisfactory where all factors were known and under control. He also reminded the members of the division that competent designing is essential in any consideration of higher stresses to insure structural safety. Compression members, he concluded, remained the critical element in structural steel design. Unit stresses for these should not be increased.

Prof. Hardy Cross reviewed the possibilities of using reinforced concrete in the interest of conserving structural steel. He outlined the following means of steel conservation: (1) substitution of other materials; (2) curtailment of non-war construction; (3) use of higher working stresses and (4) special design, stating that in his opinion the importance was relative but in the order listed. He reminded the division that any program to save steel is not essentially engineering design, but a new concept of construction based on an emergency situation.

Use of timber for building construction in the interest of conserving steel was the subject of a paper by John J. Gould, consulting structural engineer, San Francisco. This paper reviewed the design features of the more important structures built for the International Exposition and followed by describing some of the full size tests conducted as part of a comprehensive research program

Insignia of the Navy's new construction forces

Inauguration of construction battalions in the Civil Engineer Corps of the Navy (ENR April 2, p. 1) obviously called for an appropriate insignia, and credit for the one pictured here, which has been given official status and will appear on the battalions' major items of construction equipment, goes to officers, enlisted men and civilian employees of the public works division of the Naval Air Station at Quonset Point, R. I., who also suggested the pseudonym "Seabees," i.e., C.-B.'s, for construction battalions.

The insignia portrays a flying bee—fighting mad—with a sailor hat on his head, a spitting "Tommy Gun" in his fore hand, a wrench in his second hand, and a carpenter's hammer in his rear hand. In respective order his sleeves bear the Naval rating badges of a Gunner's Mate, Machinist's Mate and Carpenter's Mate, each indicative of the tool in the respective hand. The background is sea blue and the whole is encircled by a hawser to identify it as being a part of the Navy. Also included is the

corps device of the Civil Engineer Corps of the Navy on each wrist of the bee, to indicate the relationship to that Corps of Naval officers and the Bureau of Yards and Docks of the Navy Department, which is the parent organization of the Seabees.

sponsored by the lumber interests and the WPA. The author has been in charge of this test program which is now about complete. The paper also described two structures framed in timber which the author had recently designed in connection with war work. In addition to general design characteristics, the author also discussed details of framing and connections.

Construction division

Organization and construction procedure developed during the construction of a large powder plant in Virginia was stressed by Howard L. King, chief engineer, Mason and Hanger Co., at the construction division meeting. Problems of access, preparation of the site, assembling crews of thousands of men, distributing 80 freight carloads of materials per day during construction and the inter-relation of all elements of construction were covered in the presentation.

The use of heavy construction equipment in war work with particular reference to carrying-scrapers was reviewed by Kenneth F. Park, chief field engineer, R. G. LeTourneau, Inc. The development of this type of earth-moving equipment was traced, with information on capacities and the units available for the present war effort. The paper was accompanied by slides showing modern types of this equipment on war projects.

In a discussion of this paper, F. C. Ruhloff, Bucyrus-Erie Co., presented information and operating statistics on use of large power shovels and draglines for earth-moving service. He mentioned the adaptability of the equipment units for other use on construction jobs, as distinct from shovel loading into trucks or other hauling units.

The trend of earth-moving costs which have declined steadily during the past 15 years from 36 to 21 cents per cu.yd. as compared to the rising tendency of the general construction curve was pointed out in discussion by J. I. Ballard, *Engineering News-Record*.

Road transport in war

Husbanding of motor vehicle resources is essential to the war effort, said H. S. Fairbank of the Public Roads Administration at the opening session of the general meeting. Curtailment of manufacturing of motor vehicles along with curtailment of recreational use was expected by highway authorities, he said, but that it would be as drastic as the cut now in effect was beyond conception. Few yet realize the need for conserving motor vehicles and tires if essential services are not to suffer.

Mr. Fairbank urged state highway departments to follow the lead of New England and Middle Atlantic states in setting uniform upper limits on wheel loads and dimensions for motor vehicles using their roads. This, he said, will help to speed motor truck movements by eliminating delays at state borders or delays due to the need for special permits to transport war materials across states having low limits. The limits set by the agreement between the New England and Middle Atlantic states are as follows:

Width	96 in.
Height	12½ ft.
Single vehicle length	45 ft.
Weight per inch of tire width	600 lb.
Axle load	18,000 lb.
Gross load	
2-axle vehicle	30,000 lb.
3-axle vehicle	40,000 lb.
Semi-trailer combination	40,000 lb.
Other combinations	40,000 lb.

Qualified agreement with Mr. Fairbank's proposal was expressed by Thomas R. Agg of Iowa State College. Dean Agg favored raising load limits where that can be done without risk of injury to the highway surface, but said that highway departments should be hard-boiled in checking the movement of overloaded trucks. A few overloaded trucks—of which there are many these days—can destroy a valuable traffic artery in a short time, thus in the end seriously interfering with the war effort. Dean Agg said that federal agencies should help in ending the "curse of overloading" by taking drastic steps against violators.

Highway maintenance

Dean Agg also drew attention to the rapid deterioration of older highways under war traffic and said that maintenance of these roads under war conditions has become a major problem.

Like views were expressed by James A. Anderson, commissioner, Virginia Department of Highways, who said that maintenance of roads for essential civilian traffic movements as well as war industries is an absolute necessity. Virginia expects a 26 percent cut in highway revenues this year as against a 16 percent increase last year. As a step in providing adequate funds to maintain main roads, the state legislature has changed the apportionment of funds to secondary roads from a fixed amount to a percentage of the net revenue. Virginia has $14,000,000 for access roads with another $8,000,000 in prospect, hence its construction program for 1942 is larger than normal. This may make possible the creation of a reserve for maintenance work in 1943.

Thomas E. Stanton, California Division of Highways, said that where highway foundations are good, load limits can be raised with safety if maintenance is not neglected, but if foundations are poor, waiving load limits will only result in destruction of the highway for any use. Mr. Stanton expressed the view that it may be necessary to set a limit on war loads to check highway destruction.

Road funds must be concentrated on provision of adequate service in the quickest time rather than on provision of the best possible road for the money, according to Roy W. Crum, director, Highway Research Board. This means he added, that research today must be directed toward making the most of available materials. The Highway Research Board expects to get out bulletins on such subjects as the information becomes available. Subjects covered will be meeting shortages of steel for bridges, concrete pavements, guard rails, signs and culverts, also shortages of curing materials and traffic paints.

Civil engineer in service

Capt. L. B. Combs, assistant chief of the Bureau of Yards and Docks, speaking at the Wednesday luncheon meeting, said that the Civil Engineer Corps of the Navy has grown from 209 at the Armistice of World War I to 1,350 at the present time. This figure is expected to go to 1,800 or even 2,000 as the naval construction regiments now being organized are put into service. These new regiments (*ENR*, April 2, p. 509) are a radical departure from past practices of the Navy made necessary by the amphibian character of modern warfare. Three battalions of 1,073 men each are now being recruited. Each is made up of four construction companies and one headquarters company commanded by officers from the C.E.C., which is the first time in history that these officers have commanded troops. Original plans called for six regiments (twelve battalions) totaling 20,000 men, but the Navy has just been authorized to increase this to twelve regiments totaling 40,000 men.

Activities of the Corps of Engineers, U. S. Army, were discussed at the Thursday luncheon meeting by Major General Eugene Reybold, Chief of Engineers of the Army. While civil engineering work of the Army normally is divided into two parts, combat and construction, General Reybold said, the construction operations now approach the character of those of combat units due to the present emphasis on speed and on use of available materials. In this construction program, the corps has leaned heavily on professional engineers and have found that they will go wherever they are needed and will do whatever is required of them. As an example he cited the projected Alaska Highway. Pioneer troops were sent in to make the preliminary surveys but civilian engineers and contractors will be called on for the permanent work. Some construction, General Reybold said, may be done by the Army's new construction regiments.

MEN AND JOBS

Timothy G. Sughrue, of Portland, Me., has been made chief engineer of the Boston & Maine Railroad Co., the Maine Central Railroad Co., and the Portland Terminal Co., succeeding the late William T. Cummings.

Lieut. Robert Earl, of the U. S. Coast and Geodetic Survey, is in charge of a party stationed at Whiteville, N. C., doing survey work for the War Department.

Roy Johnson, draftsman, and **Marshall Werth** and **E. Christiansen,** of the Plans Department, of the South Dakota State Highway Commission, have resigned to accept posts with the Stanley Engineering Co. at Sioux Falls, S. D.

Three new members of the Missouri State Highway Commission, recently appointed, are: **George H. Davis,** of Kansas City; **Baxter B. Bond,** of Hannibal, and **E. N. Meador,** of Cassville.

Walter M. Swietlik, commissioner of public works for the city of Milwaukee, has been reappointed for a two year term.

J. P. O'Hara has been reappointed to membership on the Portland, Ore., housing code commission for a term expiring March 10, 1945.

Stanley G. Phillips, of Melrose, Mass., has been made engineer of maintenance of way for the Maine Central Railroad Co. and the Portland Terminal Co. Mr. Phillips has been terminal division engineer.

Malcolm N. Yancey has been reappointed city manager of Tallahassee, Fla.

Capt. R. E. Shepherd, in charge of the Corps of Engineers area office at Durham, N. C., has been promoted to the rank of major.

B. L. Pope, Monroe, N. C., has been appointed superintendent of public works for the town of Newton, N. C., replacing **Carl C. Lanford** who resigned to accept a similar position at Greer, S. C.

J. H. Beatty, of Orangeville, Ont., has been named county engineer and road superintendent of Grey County, Ont.

Recent changes in the Indiana State Highway Commission personnel include: **Wayne Gentry,** appointed district superintendent in the Crawfordsville district, succeeding **Berne Welsh,** who was made an assistant project engineer; **Ray Colglazier,** appointed superintendent in the Paoli district, succeeding **Glen Bowen,** who resigned; **William B. Noel,** appointed superintendent in the Vicennes district, succeeding **Winn H. Reel,** who became an assistant project engineer.

Jewett Johnson, of Sisseton, S. D., has been appointed highway superintendent for Roberts County, to finish the term of Elmer Wilson, who died recently.

Paul Mousel, an engineer with the Henningson Engineering Co., at Omaha, Neb., has taken a leave of absence to join Davis & Wilson, of Lincoln, who are doing war construction work near Denver, Colo.

Duff A. Abrams, New York consulting engineer, has been awarded the Frank P. Brown Medal of the Franklin Institute, Philadelphia, for his work in discovery of fundamental design basis for concrete and reinforced-concrete mixtures.

Harry Nelson, layout engineer for the city of Milwaukee, Wis., was recently appointed superintendent of street sanitation.

G. F. Briggs, materials engineer for the Nebraska State Highway Department, has returned to Lincoln after spending two years building Nebraska-type roads in Argentina and Brazil.

Emmon Robbins, city engineer of St. Francis, Kansas, has been appointed Thomas County engineer and will make his headquarters at Colby, Kan.

Robert C. Patten, formerly South Carolina manager for the Dixie Culvert & Metal Co., of Charleston, has become a captain in the Corps of Engineers.

William W. Donnelly, of Philadelphia, Pa., an engineer for the Atlantic, Gulf & Pacific Engineering Co., is one of the Americans interned by Japanese at Manila, P. I., according to advice received by his family.

Capt. Thomas DeF. Rogers, assistant to the supervising engineer of the Special Engineering Division, Panama Canal, has been promoted to the rank of major.

Eric Jacobsen, structural designer for the Dominion Bridge Co. Ltd., of Lachine, Que., has become assistant director general for the Australian War Supplies Procurement Commission in Washington, D. C.

Jerome Evans, field engineer for the WPA at Sunbury, Pa., has resigned to accept an engineering post with the Navy Department.

Genevieve Rose, civil engineer of Winner, S. D., has received a civil service appointment as assistant engineering draftsman with the U. S. Coast and Geodetic Survey and will report to that agency at Philadelphia, Pa. Miss Rose, a graduate of South Dakota State College in 1932, was the first woman to receive a civil engineering degree from that school.

W. E. Vinson, construction engineer with the District WPA office at Durham, N. C., has been commissioned a lieutenant (J.G.), in the United States Navy.

D. W. Chesley, highway superintendent of Hughes County, S. D., for the past ten years, has been granted a leave of absence to join the Corps of Engineers at Provo, S. D.

Col. C. R. Moore, U. S. district engineer at Portland, Ore. since 1938, has been assigned to troop duty at Fort Lewis, Wash. He has been succeeded by **Lt. Col. Donald Leehey,** formerly executive assistant engineer.

A. B. Hicks has been assigned by the Federal Works Agency as construction engineer on projects near Sitka, Alaska.

Matt Hally, formerly district engineer for the Idaho state bureau of highways at Coeur d'Alene, has been appointed state highway director, succeeding **Sam E. Johnson,** who resigned recently to accept the civilian post of supervising engineer with the Corps of Engineers in Alaska.

E. S. Severance has been appointed assistant city engineer at Bremerton, Wash.

W. S. Hannan, engineer of survey and design with the South Dakota State Highway Commission, has been granted a leave of absence to accept a position as supervising engineer with Perkins and McWayne- Stanley Engineering Co., of Sioux Falls, S. D.

E. W. Swan, formerly resident engineer for the Idaho state highway department at Wallace, has been named district engineer at Coeur d'Alene.

T. B. Patterson, plant engineer at the Radford Ordnance Works, Radford, Va., has been appointed project engineer for construction of a new ordnance plant in Kansas.

John Farquharson, draftsman for the New York state highway department, has been called to active service as a chief petty officer in the U. S. Navy engineering division.

BRIEF NEWS

A BILL increasing authorized funds for access roads from $150,000,000 to $250,000,000 has been approved by a House Committee and is now before Congress.

GOVERNOR Sam Jones of Louisiana has predicted that government approval will soon be forthcoming for a new outlet to the sea for New Orleans—a 20-mile long canal leading from the present industrial canal to the Mississippi Sound. The construction would cost about $2,000,000, and the new waterway would parallel the present Louisville-Nashville Railroad right-of-way.

THE Durham, N. C., City Council recently amended its building code to permit the use of certain substitute materials for materials whose use is now restricted by priority orders.

H. H. JOHNSON, manager of the Shredded Steel Co., conferred recently with Mayor Neal Pickett of Houston, Tex., in preliminary moves for the collection of tin cans and the construction in Houston of a tin processing plant. The company recently has made arrangements for the construction of similar plants in Dallas and Kansas City, Mo. The shredded cans are used in copper mine leaching processes.

ALL sophomores in the School of Engineering at North Carolina State College, Raleigh, N. C., recently were required to take tests in government and citizenship. Those failing the test are required to take and pass a regular course in government before being permitted to graduate as engineers.

THROUGH an executive order from the office of Ohio's Gov. John W. Bricker, immediate enforcement of a 40 mile an hour speed limit for all state-owned motor vehicles has been made effective under a penalty of suspension or discharge of any state employee found exceeding that limit. As soon as possible, all state-owned cars will be equipped with governors limiting their speed to a maximum of 50 miles an hour.

GRAND COULEE Dam's installed capacity has been increased to 344,000 kw. through the addition of a third main generator. The dam's output is now greater than than at Conowingo Dam on the Susquehanna River in Maryland or Wilson Dam and other structures of the TVA. It is about half the output of the now inactive Dneiper Dam in Russia, or of Boulder Dam on the Colorado River.

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Kentucky road bureau ends year with surplus

The Kentucky State Highway Department closed its fiscal year March 31, with a net surplus of $1,905,584, Arch Bennett, state director of accounts and control, reported last week. The department's net receipts from taxes and fees were listed as $24,164,237, and expenditures were $21,293,913.

Highway Commissioner J. Lyter Donaldson said the surplus would be applied to this year's road work and would be welcome because of decreasing incomes due to falling off in gasoline and other income sources.

Michigan pools use of state-owned cars

A central garage and dispatching agency has been set up in Michigan to pool the use of more than 200 state-owned cars as a war conservation measure. The plan is reported to be the first of its type to be adopted.

Under the system, all passenger cars purchased out of the state general fund go into the pool. Not included are cars belonging to the state police, highway and conservation departments and state-supported colleges and universities—which bought their vehicles out of individual agency funds. Elective officials may retain one automobile each.

A total of 111 cars went into the pool the first week, 50 of them forming the nucleus of cars for use, and the remainder to be stored until present operating units wear out. Each agency turning in cars is credited with the appraised value of the vehicles, to be used to offset charges for use of cars in the pool. Requests for transportation go into a central office which combines those showing common destinations and dates to permit as many passengers as possible to use a single car.

The state has set up a $10,000 cash account to provide for initial expenses.

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Foundation starts study of parking problems

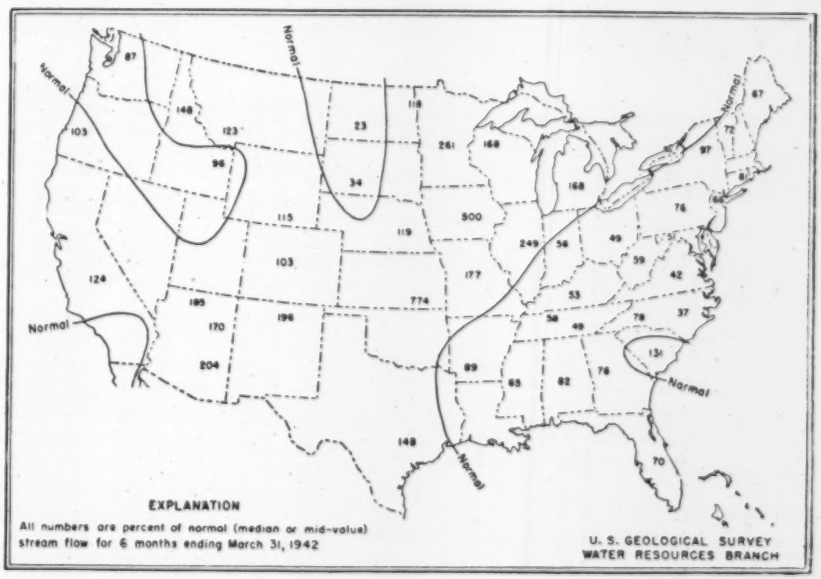
In an attempt to provide a uniform formula to cure municipal car parking problems, the Eno Foundation for Highway Traffic Control, at Saugatuck, Conn., has announced that it will make this problem its next project.

Stream flow tabulation for six-month period shows many changes

The past six months was a period of broad change and transition in streamflow conditions over the United States, a half-yearly tabulation shows. In October, 1941, a nearly year-old pattern featured by extremes of drought in the East, excesses of runoff in the Southwest, and normal stream flow in the Northwest reached a climax of contrast. Floods, excesses of flow and large increments to ground water were taking place from Oklahoma to Minnesota.

During the succeeding six months there was a progressive modulation of these outstanding extremes, so that during March, 1942, there were no areas where flow was greatly deficient and excessive flow was localized.

A new pattern, perhaps transitional, seems now to have formed. About normal stream flow throughout the country with only localized deficiencies or excesses appears in prospect.



Swiss railroads map 10-year building program

In accordance with a suggestion made by federal labor delegates, the Swiss Federal Railroads have completed plans for a 10-year building program which will involve an expenditure of 750 million Swiss francs.

Providing for completion of double tracks on the St. Gotthard route, between Basel and Chiasso; the Geneva-Romanshorn route; Basel-Zurich-Chur and Vallorbe-Lausanne-Simplon, the program is designed to take care of possible unemployment in the post-war period. Swiss railroad men said, however, that unemployment in the country is "negligible" at this time.

Commenting on the need for the work, the railroad officials said that the St. Gotthard railway established a new record in 1941, with an average of 40 passenger and 80 freight trains in both directions daily. An important step to relieve this congestion was taken in January of this year, when the second Avenberg tunnel was driven between Sisikon and Fluelen, along the lake of Lucerne. This tunnel, will be placed in operation next autumn. The old tunnel will be renovated, and construction of a second tunnel between Brunnen and Sisikon will be started.

At the end of 1941, electrification of the 1,716 mile Swiss Federal Railroad System was 74.2 percent completed. Meanwhile electrification of privately owned railways, excluding trolley and cable lines, was 83 per cent completed. Electrification of the following sections is scheduled under the new plan: Zurich-Oerlikon-Wettingen; Auvernier-Les Verrieres; Winterthur-Schaffhausen and Wil-Wattwil.

Upon completion of the 10-year plan, 53.5 percent of the system will have double tracks, compared with 38.8 percent today; and 80 percent of the system will be operated electrically, compared to the 74.2 percent at present.

For military and technical reasons, certain lines of the system are to retain steam traction.

Replacement of rolling stock is another important factor on the schedule as well as construction of underpasses at various crossings of railroads and streets.

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Muscle Shoals plant to aid rubber production

Nitrate Plant No. 2, one of several at the huge TVA-controlled Muscle Shoals hydroelectric development, is to be converted for the production of calcium carbide for use in the manufacture of synthetic rubber, David E. Lilienthal, TVA director, said last week.

Five unused electric furnaces, a part of the original nitrate-making installation, will be rehabilitated at a cost of a million dollars to manufacture the new product. The production, of about 70,000 tons of calcium carbide annually, will be used in the manufacture of neoprene synthetic rubber.

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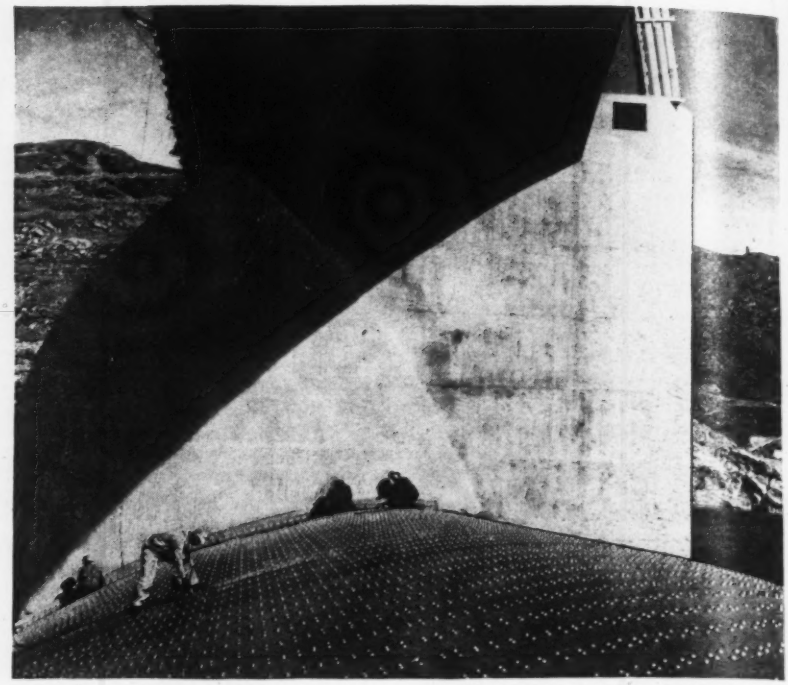
Quebec considers buying private power utility

A bill that would create a hydroelectric commission in the province of Quebec to take over and operate all privately-owned electric companies, has been introduced in the provincial legislature by P. E. Cote, Minister of the Department of Lands and Forests.

The measure contains a guarantee that companies taken over by the commission would be indemnified according to rulings of the Superior Courts of the Canadian province.



Getting ready for first water over Grand Coulee Dam

A spectacular waterfall, 1,650 ft. wide and 350 ft. high, will spill over the drum gates of Grand Coulee Dam this summer when the reservoir of the Columbia River rises to its maximum level.

Engineers for the Bureau of Reclamation had originally decided to pass the entire flood volume of the river through the dam's outlet tubes, preventing the water from overflowing the crest of the 11 drum gates in the spillway section. However, on investigating the problem, it was decided that uniform discharge over the entire length of the spillway will produce flushing action in the concrete bucket at the bottom of the incline and remove any debris now in the bottom of the trough.

No forecast has been made as to the date of the expected overpour, and engineers are storing excess water, which normally would flow through the outlet structure, to maintain the level of the river below the dam at its lowest possible point to allow contractors to complete concrete pouring behind timber bulkheads protecting the east powerhouse.

Facilities of town near Coulee Dam put on block

Virtually every business, including the local bank, which contributes to the life and comfort of residents of the town of Mason City, Wash., will be put up for sale within 30 days by the Bureau of Reclamation. Seventeen concessions—a drugstore, bank, drygoods store, grocery and meat market, hardware store, beauty parlor, hotel, theatre, barbershop, shoe shop, coffee shop, garage, dentist office, laundry, service station, and hospital—are to be let on contracts running from five to ten years.

The Bureau announced that it had agreed to take over the town, a short distance down stream from Grand Coulee Dam, from Consolidated Builders, Inc., on Sept. 1. Much of its personnel having left the area and its contract for the dam's east powerhouse scheduled for completion by the end of the year, the contractor wished to be relieved of the responsibility of operating the town.

Approve many sewer jobs as war necessities

With suddenly increased population and manufacturing activity placing unusual loads on sewerage facilities, many communities last week were planning extensive expansion programs.

Among the projects planned were:

A $400,000 addition and alteration program at Stratford, and construction of a $35,000 disposal plant sewer at Bridgeport, Conn.; a $125,000 disposal plant at Kittery, and a $52,000 sanitary sewer extension at Bath, Me.; construction of a sanitary sewer at Ayer and a sewer at Chicopee, Mass.; $23,555 worth of extensions to sanitary sewers at Portsmouth, N. H.; a disposal plant sewer in Bellmawr, addition to the disposal plant at New Brunswick, a disposal plant sewer at Wrightstown and a pumping station at East Paterson, N. J.; relief and storm sewers and installation of pumps and accessories at Cheektowaga, additions and improvements to existing treatment facilities in Tonawanda, an outfall line at Mattydale, and a sanitary trunk sewer at Rome, N. Y.; six sewer projects in Pennsylvania, including Hatboro, Ellwood City, New Kensington, and Corry; an addition at Springfield Village, Vt., and an $18,741 program for extensions and replacement of lines at Hope, Ark.

Meanwhile, at Tulsa, Okla., city engineer W. R. Wooten pondered the next move in an attempt to get nearly $4,000,000 worth of sewer work under way. A bond issue of $3,833,000 was authorized in December and the city had advertised for bids on the laying of about three-quarters of a mile of storm drain, some sanitary sewers and the construction of a million-dollar treatment plant.

First item up for bids was the storm sewer, cost of which had been estimated between $47,717.55 and $55,298.20. No bids were received because contractors said they could not come within the estimates. Wooten and other city officials, say they now fear that a similar situation may occur when bids are advertised for construction of the treatment plant.

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Western road men urge easing load restrictions

Suspension of divergent state regulations affecting the size and weight of motor trucks engaged in transporting commodities essential to the war effort, was urged last week at a special two-day session of the Western Association of State Highway Officials, held at Salt Lake City, Utah.

The resolution noted that duplication of equipment required because of present varying state load limit laws is inimical to the war effort. It urged, however, that the public be warned of the operation on the highways of oversize vehicles, and urged immediate temporary measures to strengthen highway bridges whose capacity may be inadequate.

Other resolutions adopted pledged the officials to cooperate with the War Production Board's conservation order but to maintain existing vital highways at proper efficiency, and asked some action for altering, suspending or cancelling contracts for construction entered into prior to the date of the WPB order.

At closing sessions the group elected Robert Lee Bobbitt, a member of the Texas Highway Commission, as president. W. R. Hutchins, engineer for the Arizona Highway Department, was elected vice president and John E. Furlong of Denver was re-elected secretary-treasurer.

Plan dormitory buildings for shipyard workers

With utmost speed as its construction keynote, the first dormitory project in the United States specifically built to house shipyard workers will be ready for tenants within thirty days at Vancouver, Wash., according to Paul H. O'Donnell, senior construction engineer for the Federal Public Housing Authority.

Ground was broken on the 69 acre site—six-tenths of a mile east of the Kaiser shipyard on the Columbia River—on April 11.

The completed project will consist of five two-story buildings, each housing 400 men, and a dining hall with a capacity of 600. Twenty-four acres of the site will be taken up by buildings and the rest will be devoted largely to lawns and recreation areas.

Speeding the War Effort

America's war effort goes forward at an increasingly faster rate, through many agencies and in many fields. Here are some developments of the past week of special interest to the engineer and constructor:

Kentucky's Banking Director Hiram Wilhoit last week issued a ruling insuring unlimited financing of war industries working under contract guaranteed by the Army, Navy or Maritime Commission. The ruling removes restrictions limiting loans to not more than 20 percent of a state-chartered bank's capital and surplus, and makes immediately available more than $150,000,000 in cash for lending. It is expected to hasten conversion of Kentucky plants to war production.

Continuing its search for strategic minerals to replace sources of supply cut out by war action, the Geological Survey of the Department of the Interior last week reported finding deposits of tin in old workings on Irish Creek, in the Blue Ridge Mountains of Rockbridge County, Va.; and of chromite deposits on North Elder Creek, in Tehama County, California. Meanwhile, to increase production of another vital material, the Defense Plant Corp. has announced that it will finance a $4,000,000 addition to an aluminum plant near Bauxite, Ark., to transform high-grade florspar into synthetic cryolite; and in the area near Natchez, Texas, the Natchez Butadiene Co., formed by a group of oil refining companies, plans construction of a $40,000,000 plant for producing the material, which is the basic petroleum ingredient of synthetic rubber. This plant, to be financed in part by the Reconstruction Finance Corp., will have a capacity of about 75,000 tons of butadiene a year.

To meet shortages in trained manpower for war work, the Tennessee Valley Authority has expanded its apprenticeship program to develop potential abilities of present employees, and is conducting a training program to enable women to fill additional positions. About 1,400 employees have been inducted into the armed forces, of about 34,000 now employed. Increased employment of women, not only for clerical but also for other positions, is being made possible by the training program. For example, women are being employed as computors in the engineering offices at Chattanooga, some have been enrolled in apprentice courses in engineering draftsmanship, and application cards are now being prepared for recruiting women as accountants.

Officials of Louisville, Ky., last week were torn between the patriotic wish to aid the war program and a matter of economics, in the disposal of some 3,500 tons of abandoned street car track now in the city streets. James B. Wilson, city enigneer, said that there are 5,500 tons of steel in track not used, of which 3,500 tons have been abandoned completely. However, said Mr. Wilson, the cost of removing the rail and repairing the streets would be 80 cents a lineal foot, or more than the price the rails would bring if sold at the prevailing rate of $20 a ton. The city considered asking WPA to sponsor a project for removal of the rails, which might bring cost of removal for the city closer to revenue from sales.

End of a block in the Continental Divide Tunnel. Two sources of light are used (right), and the block signal system gives a red indication only when a locomotive or train interrupts the beam from both sources falling on the relay at the left.

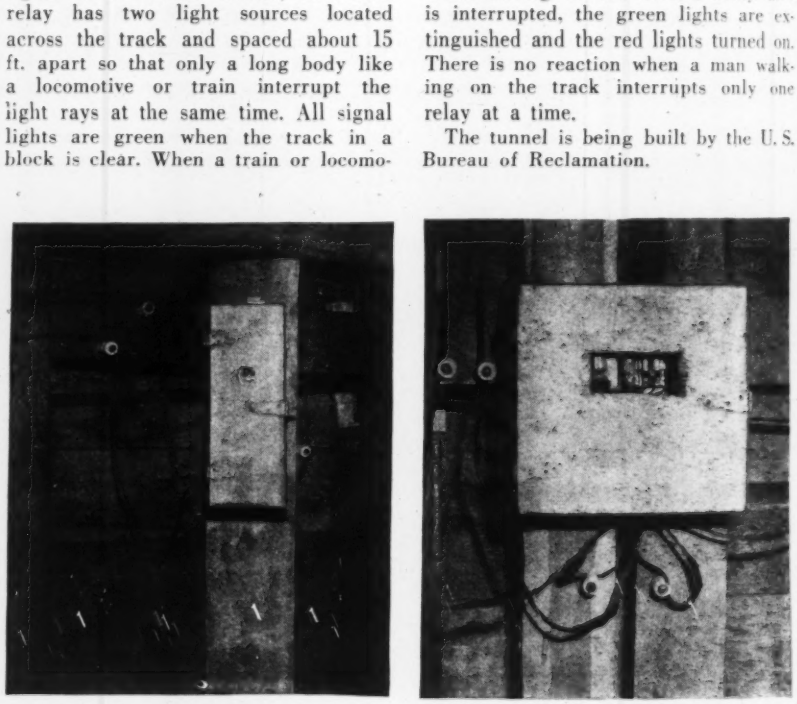
Photo-electric block system speeds tunnel trains

A photo-electric block signal system, entirely free of any rail connection, is being used to speed the movement of construction trains in the 13-mile Continental Divide Tunnel being driven between Grand Lake and Estes Park in Colorado as part of the Colorado-Big Thompson project.

A single-track line, 24-in. gage, extends from the portals to the headings, with passing tracks at frequent intervals. As trains operate in both directions on these lines, movement could be speeded and delays on passing tracks avoided if train crews could be kept advised as to the condition of the track ahead by some form of block signal system, but the normal type of block signal, using rails to carry the signal current, involved the risk of premature ignition of blasting charges. Also, maintenance of track circuits would be difficult under tunnel conditions.

To meet these conditions, the General Electric Co. devised a block signal system using the "electric-eye" principle, which has its own circuits, all carried on the tunnel wall entirely free from any track connection. The track is divided into blocks about 6,000 ft. long, each block ending at the turnout of a passing track. At the beginning and end of each block two photo-electric relays were mounted on the walls about 30 ft. apart at a height where trains interrupt the beams from the photo-electric cells. The relays control the operation of red and green signal lights in the block ahead, and each relay has two light sources located across the track and spaced about 15 ft. apart so that only a long body like a locomotive or train interrupt the light rays at the same time. All signal lights are green when the track in a block is clear. When a train or locomotive enters the block and interrupts the light beams directed on the first relay, there is no reaction, but when the light beam falling on the second relay also is interrupted, the green lights are extinguished and the red lights turned on. There is no reaction when a man walking on the track interrupts only one relay at a time.

The tunnel is being built by the U. S. Bureau of Reclamation.



Both the light source (left) and the relay box (right) are located on the tunnel walls free from any track connection.

Blue Ridge parkway to become toll road

A toll of 25 cents per day per car will be charged for travel on the Blue Ridge Parkway beginning in May, according to an announcement by the National Park Service. Receipts will be used to offset the cost of maintenance.

Persons living nearby or spending several days on the parkway will be permitted to purchase yearly passes for one dollar.

Transfer Engineer Corps testing laboratories

The Corps of Engineers has announced that its Cincinnati testing laboratory and the Pittsburgh soils laboratory, both attached to the Ohio River Division have been transferred to Mariemont, Ohio. The Cincinnati testing laboratory was formerly located at Sayler Park Station, and the Pittsburgh office at 7721 Susquehanna St.

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WPA plans road work

Highway work will be given first place in the WPA program in Pennsylvania for 1942, according to H. R. Davidson, director of the Commonwealth's work relief program, and coordinator of WPA work for the state highway department.

Material necessary for most roadwark is readily available, Mr. Davidson said, and, since highway work is closely associated with speeding the war effort, WPA's accent is being placed on highways. He added that with WPA aid, the state will be able to sponsor a program comparable in size to that of 1941, under which an average of 18,000 men were employed.

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Missouri changes road bidding procedure

The Missouri highway department has notified all contractors qualified to bid on highway work that no extensions of time or remissions of liquidated damages will be considered after a job is completed.

The notification said all such questions must be presented accompanied by substantiating information, and considered while the work is active.

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Move FWA branch office

The Philadelphia office of the Federal Works Agency has moved from its former location at Broad and Stiles Sts. to 803 Widener Building.

Floods in West and Southwest cause serious damage to roads and bridges

Shortages in steel and other building materials increases normal repair task; Dallas sees worst flood in many years.

Highway, bridge and railroad engineers, facing the usual problems of repairing damages to structures and roads caused by annual spring floods, last week faced an entirely unexpected development attributable directly to the nation's war effort.

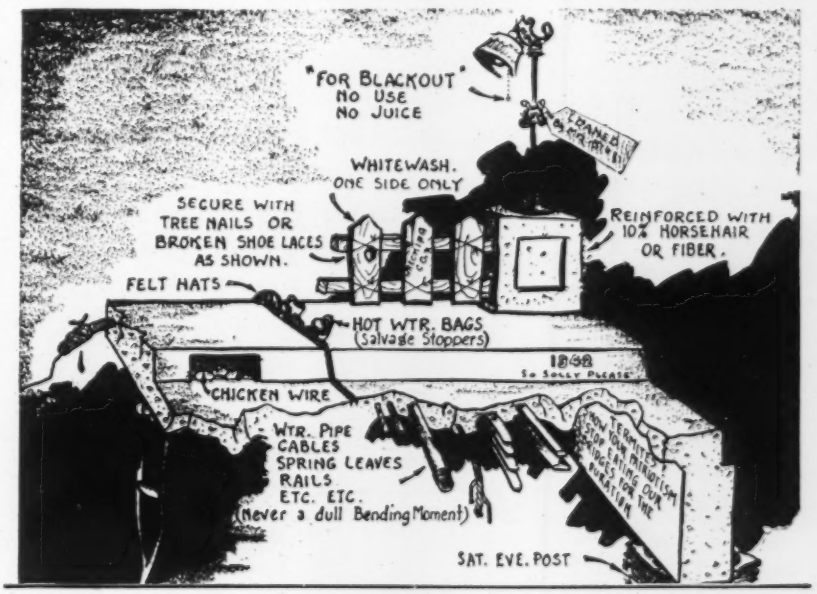
That problem was the shortage of steel for making repairs. In the series of spring floods which started several weeks ago throughout the country (*ENR*, April 16, p. 585), much damage had already been done. Engineers rushed repairs with what materials were at hand, mostly timber for bridges and such other materials as could be obtained.

Most serious flood reported in the nation last week occurred when the Trinity River in eastern Texas, swollen by heavy spring rains at its headwaters, flooded a great portion of the city of Dallas, destroyed more than 21 bridges of varying sizes in Dallas County, and took five lives in the immediate area. (Starting on Tuesday, April 21, the river rose far above former flood stages, and inundated the countryside and a part of the city, the water not fully subsiding until three days later. Damage included the destruction of city streets and roadways, the weakening of piers on the Houston St. viaduct and weakening of some of the levees protecting the city. Throughout Texas last week streams overflowed their banks, and did untold damage to crops and highways. Among localities flooded were Cleburn, Waco, McKinney, Hillsboro, Denison and Greenville.

Meanwhile, the usually placid South Platte River roared over its banks above Denver into a stream more than a mile wide, flooded low lying roadways and homes. At Trinidad, Colo., the Purgatoire River, in its worst flood in 38 years, killed two persons and left dozens of families temporarily homeless, tore up a railroad bridge and some sections of track, and left the city virtually isolated for more than a full day.

Heavy rains in south central Oklahoma flooded the business district at Tishomingo and washed out a railroad bridge near Stringtown, causing the derailment of a freight train and the death of a trainman. Numerous highways in the area were closed to traffic by floods, and many smaller bridges destroyed.

The New Orleans, La., levee board was worried because of its failure to obtain necessary priorities for purchase of 75,000 sandbags to bolster the levees that protect the city.


"FOR BLACKOUT" NO USE NO JUICE
WHITEWASH. ONE SIDE ONLY
SECURE WITH TREE NAILS OR BROKEN SHOE LACES AS SHOWN.
REINFORCED WITH 10% HORSEHAIR OR FIBER.
FELT HATS
HOT WTR. BAGS (Salvage Stoppers)
CHICKEN WIRE
WTR. PIPE CABLES SPRING LEAVES RAILS ETC. ETC. (Never a dull Bending Moment)
SAT. EVE. POST

Bridge Details — 1942

To save critical materials for war uses, substitutes have been diligently sought by the bridge department of the California Division of Highways and many ingenious ways and means have been devised to build structures without the materials normally available. Under the stress of this search for substitutes, one of the designers recently handed in the accompanying sketch as a suggestion for 1942 standard bridge details.

OBITUARY

George H. Sager, 47, an engineer for Ford Bacon & Davis at Galveston, Tex., for the past two years, died April 23. Mr. Sager, formerly a resident of Louisville, Ky., had been secretary-engineer for the Louisville planning and zoning commission and Kentucky PWA administrator.

Robert F. Vogt, 62, consulting engineer for the Allis-Chalmers Mfg. Co., Milwaukee, and an employee of the firm for 36 years, died April 17 at Milwaukee.

Clarence C. Shaw, 45, a civil engineer for the Phillips Petroleum Co. at Kansas City, Kan., died April 20.

Elmer Wilson, county highway superintendent of Roberts County, S. D., died recently.

Benjamin F. Taylor, 59, U. S. highway engineer with the Federal Public Roads Administration, died April 19 at Kansas City, Kan.

John Glenn Mason, of Lincoln, Neb., a bridge engineer for the Nebraska department of roads and irrigation, died recently enroute from Elkhorn to Lincoln.

Benjamin Franklin Taylor, Jr., 60, senior engineer of Division 5 for the Public Roads Administration at Omaha, Neb., died April 18 at Omaha.

Charles S. Kirby, 46, civil engineer and Guilford County (N. C.) surveyor, died at Greensboro April 18.

Grant R. Smith, 46, Shawnee County (Kan.) surveyor for the past seven years, died recently at Albuquerque, N. M.

Robert E. Fries, 50, retired civil engineer, died April 18 at Haddon Heights, Pa.

Raymond R. Stevenson, 58, who was an engineer on the construction of the Welland Canal and the Mount Royal tunnel near Montreal, Canada, died recently at Fredericton, N. B. At his death, he was civilian engineer with the Royal Canadian Engineers.

Lester A. Peterman, retired contractor long identified with the firm of Peterman & Cooper, died recently in Pueblo, Colo.

William Jackson, 74, retired bridge engineer for the American Bridge Co., died April 22 at Ambridge, Pa.

Lawson B. Porter, 34, formerly a member of the engineering staff of the National Harbors Board of Canada and for the past two years a bridge engineer in Newfoundland, died recently at Fredericton, N. B.

Charles F. Wheeler, 59, building inspector for the Wisconsin Industrial Commission for the past 24 years, died at Green Bay April 18.

Harry Hodgman, 70, retired senior engineer of the United States District Engineer's Office at Los Angeles, died April 15.

Joseph R. Gawthrop, 92, one of the oldest civil engineering graduates of Yale University, died at Kennett Square, Pa., April 20. Some years ago he served a four-year term as city engineer of New Haven, Conn.

See probable delay in building Fort Gibson Dam

Postponement of construction of the $14,000,000 Fort Gibson Dam on Grand River in Oklahoma is probable "unless a serious need for electric power can be demonstrated", Maj. Gen. Eugene Reybold, chief of the Corps of Engineers, told local proponents of the project in Tulsa last week.

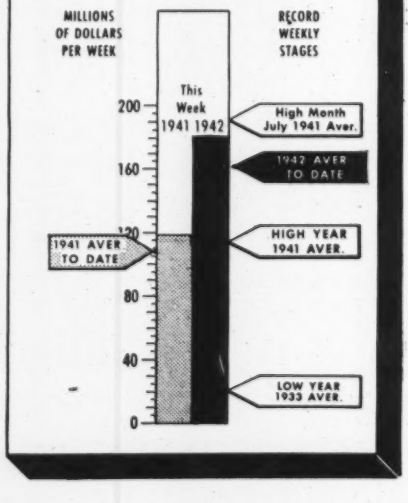
General Reybold, who was in Tulsa on a part of nation-wide inspection tour of defense plants, added that Markham Ferry Dam, the third of a three-dam hydroelectric unit which includes the Pensacola Dam also on Grand River, has been killed for the duration of the war by the Bureau of the Budget.

CONTRACTS AND CAPITAL

ENGINEERED CONSTRUCTION volume for the week, $182,270,000, climbs 53 percent over the total for the corresponding week last year, but is 15 percent below the high volume of last week. Public construction increases 76 percent over the 1941 week due to the 136 percent gain in federal work. State and municipal work is 62 percent lower. Comparisons with a week ago, however, reveal a 12 percent decrease in public work, with both federal, and state and municipal reporting 12 percent lower volumes.

Private work for the week is 60 percent below last year, and 47 percent lower than last week.

The current week's volume brings 1942 construction to $2,891,784,000, an increase of 47 percent over the 18-week total in 1941. Private construction, $251,436,000, is 53 percent lower than in the period last year, but public work is up 85 percent as a result of the 148 percent gain in federal construction.



In the classified construction groups, gains over last week are in waterworks, bridges, public buildings, and streets and roads. Increases over the 1941 week are in waterworks, public buildings, and unclassified construction.

New capital for construction purposes for the week, $13,196,000, is 12 percent above the volume for the corresponding 1941 week. The week's new financing is made up of $9,196,000 in state and municipal bond sales, and $4,000,000 in corporate security issues.

New construction financing for the year to date, $2,458,821,000, is 20 percent below the $3,059,543,000 reported for the opening 18 weeks in 1941.

CONTRACTS

(Thousands of dollars)

	Week Ending May 1 1941	Apr. 23 1942	Apr. 30 1942
Federal	$69,107	$185,730	$162,648
State & Municipal	29,578	12,981	11,318
Total public	$98,685	$198,711	$173,966
Total private	20,740	15,658	8,304
TOTALS	$119,425	$214,369	$182,270
Cumulative 1942	(18 weeks)		$2,891,784
1941	(18 weeks)		$1,962,236

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1941 18 weeks	1942 18 weeks
NON-FEDERAL	$340,706	$233,866
Corp. Securities	108,962	75,414
State & Mun.	192,053	127,089
U.S.H.A. loans	13,521	
R.F.C. loans	26,170	31,363
FEDERAL	$2,718,837	$2,224,955
TOTAL CAPITAL	$3,059,543	$2,458,821

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Apr. '42	271.78	130.64
Building Cost	Apr. '42	219.55	118.68
Volume	Mar. '42	578	253

FHA MORTGAGES

	Week Ending Apr. 26 1941	Apr. 18 1942	Apr. 25 1942
Selected for appraisal			
Title II	$36,154	$20,923	$23,086*
Title VI	$ 6,484	$12,227	$12,533*

* Subject to revision.

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

HIGHWAY, CALIFORNIA

OWNER: California State Highway Dept., Los Angeles, Calif.

PROJECT: Improvement of 11.7 miles of highway in San Diego County, Calif. Involves grading, application of bituminous surface, drainage structures, and construction of plate culverts. Priority rating is A-2.

CONDITIONS: Contractor to furnish all materials. Highway transportation facilities available. Wage rates are: skilled labor, $1.50 per hr.; semi-skilled, $1.00; and common, 87½c.

BIDS: Four bids were opened February 26, 1942, ranging from the contract low of $655,785 to $820,427.

LOW BIDDERS:

1. Clyde W. Wood, Los Angeles, Calif. (contract) $655,785
2. M. S. Ross and R. E. Hazard & Sons, San Diego, Calif. 784,314
3. Macco Constr. Co., Clearwater, Calif 796,552

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clearing and grubbing	L. S	$10,000.00	$7,500.00	$20,000.00
2. Roadway excavation	544,000 c. y.	.28	.96	1.00
3. structure excavation	8,100 c. y.	2.80	1.75	1.50
4. Ditch and channel excav	15,500 c. y.	1.00	1.00	1.00
5. Overhaul	7,496,000 sta. y.	.004	.01	.005
6. Finishing roadway	617 sta.	10.00	10.00	15.00
7. Liquid asph. SC-2, SC-3 or SC-4 (bitum. surf. trtmt.)	2,530 ton	14.50	13.50	15.00
8. Prepare, mix and shape surf. (bitum. surf trtmt.)	198,000 s. y.	.07	.09	.10
9. Liquid asph SC-2 (seal coat)	67 ton	14.00	13.00	20.00
10. Class A portland cem. conc. (struct.)	490 c. y.	35.00	40.00	50.00
11. Monuments	176 ea.	4.00	5.00	4.00
12. Laminated guard railing	2,120 l. f.	1.50	1.50	2.00
13. Culvert markers	260 ea.	2.50	3.50	5.00
14. Guide posts	285 ea.	2.50	3.40	5.00
15. New property fence	21 mi.	850.00	750.00	1,000.00
16. Drive gates	27 ea.	25.00	35.00	30.00
17. 8-in. corr. met. pipe, 16-ga	1,764 l. f.	1.40	1.45	1.00
18. 18-in. corr. met. pipe, 16-ga.	2,496 l. f.	2.50	2.50	2.50
19. 24-in. corr. met. pipe, 14-ga.	2,614 l. t.	3.75	3.60	3.00
20. 30-in. corr. met. pipe, 14-ga.	682 l. f.	4.75	4.50	4.00
21. 36-in. corr. met. pipe, 12-ga	56 l. f.	6.85	6.50	6.00
22. 36-in. corr. met. pipe, 8-ga.	166 l. f.	10.00	10.00	8.00
23. 48-in corr. met pipe, 8-ga.	182 l f	16.00	12.50	10.00
24. 48-in corr. met. pipe, 12-ga	256 l. f.	12.50	9.00	8.00
25. 54-in corr. met. pipe, 12-ga.	66 l. f.	18.00	11.00	9.00
26. Spillway assemblies	88 ea.	20.00	30.00	20.00
27. 90-in. field assembled plate culvert	75 l. f.	30.00	20.00	20.00
28. 90-in. field assembled plate culvert	245 l. f.	33.00	20.00	25.00
29. 90-in. field assembled plate culvert	135 l. f.	40.00	30.00	30.00
30. 105-in. field assembled plate culvert	45 l. f.	45.00	30.00	40.00
31. 24-in. perf. metal underdrain	132 l. f.	3.00	3.80	4.00
32. Rock filling material	40 c. y.	5.00	4.50	5.00
33. Reinforcing steel	49,000 lb.	.05	.08	.07

BRIDGE, MARYLAND

OWNER: State Roads Commission of Maryland, Baltimore.

PROJECT: Construction of bridge, steel I-beam on precast concrete pile bents, over Back River on Eastern Ave., near Essex, Md. Total length, 1,500-ft.; Roadway width, 55-ft.

CONDITIONS: Contractor to furnish all materials and complete bridge ready for traffic by December 1, 1942. Minimum wage rates specified are: skilled labor, 70c. per hr.; semi-skilled, 55c.; and common, 40c.

LIST OF BIDDERS: (Bids opened February 24, 1942.)

1. Melwood Constr. Corp., New York, N. Y. (contract) $722,910
2. Kaufman Constr. Co., Philadelphia, Pa 745,641
3. Empire Constr. Co., Baltimore, Md 795,082

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Class 2 excavation	330 c. y.	$3.00	$5.00	$2.45
2. Class 3 excavation	200 c. y.	10.00	12.00	14.00
3. Class 4 excavation	195 c. y.	50.00	12.00	15.00
4. Class 5 excavation	625 c y	3.00	12.00	4.40
5. Foundation load tests	3 ea.	300.00	500.00	500.00
6. Concrete test piles	300 l. f.	4.00	5.00	11.60
7. Load tests for conc. piles	3 ea.	500.00	500.00	680.00
8. Damp-proofing	L. S.	500.00	500.00	500.00
9. Precast concrete piles	20,000 l. f.	8.10	9.00	13.60
10. Protection coat for precast conc. piles	L. S.	10,000.00	5,000.00	13,500.00
11. Untr. Cl. B timber piles	2,300 l. f.	3.00	2.00	2.35
12. Class A concrete	5,641 c. y.	40.00	46.00	32.50
13. Reinforcing steel bars	582,000 lb.	.09	.06	.067
14. Fabr. structural steel	3,293,000 lb.	.07	.08	.0691
15. Median strip	1,490 l. f.	5.00	6.00	5.10
16. 16-in. water main	1,495 l. f.	25.00	20.00	31.25
17. 14-in. sewer force main	1,495 l. f.	12.00	7.00	13.40
18. Installation of telephone conduit	L. S.	4,000.00	2,000.00	1,150.00
19. Removal of exist. high bridge	L. S.	30,000.00	20,000.00	27,000.00

GRADE SEPARATION, CALIFORNIA

OWNER: California State Highway Dept., Los Angeles, Calif.

PROJECT: Construction of two reinforced concrete grade separation structures on the Pacific Highway at Witherby St., and a. Barnett Ave., in San Diego, Calif. Includes all excavation, paving, drainage structures and appurtenant work. Project has preference rating of A-1-e.

CONDITIONS: Contractor to furnish all materials. Work is financed in whole or in part with federal funds, therefore, all federal statutes, rules and regulations apply during construction period. Highway transportation facilities available. Wage rates are: skilled labor, $1.50 per hr.; semi-skilled, $1.25; and common, 87½c.

LIST OF BIDDERS: (Bids opened February 19, 1942.)

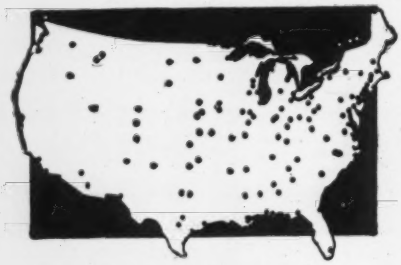
1. J. E. Haddock, Ltd., Pasadena, Calif. (contract) $761,938
2. R. E. Hazard & Sons, San Diego, Calif 834,314

Item	Quan.	Unit Prices (1)	(2)
1. Remove concrete	3,850 c. y.	$3.00	$6.00
2. Clear and grub	L. S.	750.00	1,000.00
3. Roadway excavation	3,800 c. y.	.60	.75
4. Structural excavation	47,000 c. y.	3.40	2.80
5. Trench excavation	3,000 c. y.	1.90	2.50
6. Imported borrow	6,000 c. y.	.90	.80
7. Topsoil	800 c. y.	2.10	1.80
8. Preparation of subgrade	18,500 s. y.	.13	.12
9. Water supply and equipment	L. S.	700.00	1,100.00
10. Water	400 M gal.	1.30	2.00
11. Finish roadway	20 sta.	25.00	15.00
12. Liquid asphalt SC-2 (prime coat)	3 ton	50.00	30.00
13. Liq asph. MC-3, MC-4 or MC-5 (plant mix surf.)	13 ton	19.00	20.00
14. Mineral aggregate (plant mix surf.)	245 ton	4.00	4.25
15. Asphaltic concrete	650 ton	4.80	5.25
16. Asph. emulsion asphaltic concr. (seal coat and paint binder)	4 ton	30.00	40.00
17. Screenings (seal coat)	28 ton	3.00	3.00
18. Class B portland cem. conc. pavmt	3,835 c. y.	8.50	9.00
19. Pavement dowels	1,150 ea.	.28	.30
20. Cl. A portland cem. conc. (seal)	7,550 c. y.	12.00	14.00
21. Cl. A portland cem. conc. (struct.)	10,150 c. y.	23.00	25.00
22. Steel rail	2,335 l. f.	10.60	11.00
23. Furnish concrete piles	17,640 l. f.	2.00	3.00
24. Drive piles	704 ea.	25.00	60.00
25. Cl. A portland cem. conc. (curb, gutters)	470 c. y.	19.00	20.00
26. Cl. A portland cem. conc. (sidewalks)	280 c. y.	16.50	17.00
27. Pipe handrail (Type A)	65 l. f.	5.65	6.00
28. Pipe handrail (Type B)	90 l. f.	2.60	3.00
29. 20-ft. drive gates	2 ea.	50.00	50.00
30. Move and reset property fence	260 l. f.	.55	.50
31. 10-in. rein. conc. pipe, std. str	400 l. f.	1.80	2.00
32. 12-in. as above	1,125 l. f.	2.20	2.50
33. 18-in. as above	345 l. f.	3.00	3.00
34. 24-in. as above	1,450 l. f.	3.70	4.00
35. 8-in. corr. met. pipe, 16-ga	1,234 l. f.	1.10	1.00
36. 12-in. as above	316 l. f.	1.45	1.50
37. 18-in. as above	100 l. f.	2.10	2.00
38. 24-in. corr. met pipe, 14 ga	65 l. f.	3.00	3.00
39. 6-in. perf. metal pipe underdrains	90 l. f.	.80	1.00
40. Rock fill	10 c. y.	4.00	4.00
41. Salvage exist. rein. conc. and corr. met. pipe	1,500 l. f.	.65	.75
42. Relay salv. rein. conc. and corr. met. pipe	930 l. f.	.55	.60
43. 6-in. cast iron pipe	282 l. f.	2.00	2.00
44. 12-in. cast iron pipe	885 l. f.	3.90	4.00
45. Salvage cast iron pipe	1,020 l. f.	.50	.50
46. Furnish reinforcing steel bars	582,000 lb.	.06	.065
47. Place rein. steel bars	582,000 lb.	.015	.02
48. Rubber waterstops	790 l. f.	1.10	1.00
49. Salvage frames and gratings	5 ea.	20.00	20.00
50. Frames and gratings for curb inlets	3 ea.	90.00	100.00
51. Frames and covers, catch basins	20 ea.	75.00	70.00
52. Manhole frame and cover	1 ea.	35.00	50.00
53. Adjust manholes to grade	4 ea.	25.00	25.00
54. Pump house	L. S.	1,030.00	1,200.00
55. Remove exist. pipe handrail	100 l. f.	.50	.50
56. Sidewalk drain	12 ea.	11.00	12.00
57. Electrical equipment	L. S.	25,000.00	28,000.00
58. Pump equipment	L. S.	8,850.00	9,200.00
59. Miscellaneous work	L. S.	20,000.00	15,000.00

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York
ELSIE EAVES, Manager *SCOTT McLEOD, Statistician*
(Daily service also available—Write for details)

Location of ENR Correspondents



Symbols and Abbreviations Include

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering News-Record Construction Daily
A-E-M Architect — Engineer-Management type of contract.

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Named in order of Listing)

Water Supply	Unclassified
Sewers, Waste Disposal	Latin America
Bridges, Grade Cross'gs	Public Buildings
Streets & Roads	Commercial Buildings
Earthwork, Waterways	Industrial Buildings

Stages Reported

PROPOSED: (except Streets & Roads):

BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Note: To comply with censorship requirements, addresses on some reports are being generalized. Data which would reveal the purpose of the improvements and the size are withheld. The name of contractor and general area are reported.

WATER SUPPLY

PROPOSED WORK

Calif., Martinez—Completing surveys water filtration plant. $285,000. A. Kempkey, Hobart Bldg., San Francisco and Chas. G. Hyde, 2599 Buena Vista, Berkeley, engrs.

Ill., Harrisburg—$450,000 bond election May 26, purchase, imprv. Illinois Municipal Water Co. sys.

†La., Bossier (br. Shreveport)—Federal Works Agency, Fort Worth, Tex., bids soon 44,000 lin. ft. 2- to 8-in. c.i. main. $175,000. R. L. Tatum, 413 Levy Bldg., Shreveport, engr.

Md., Baltimore — Bd. Awards, City Hall, watermains along Philadelphia Rd. from Mapleton Ave. to city line. Bureau Water Supply, Municipal Office Bldg., engrs.

†Mo., Wentzville—City, WW. imprva., drilling new well, deep well turbine pump, pump house, etc. $15,000. **FWA.** Meyers & Foster, 7545 Ellis Ave., Maplewood, St. Louis, engrs.

N. M., Santa Fe—New Mexico Power Co., 201 Don Gaspar Ave., water storage dam, Santa Fe Canyon. $250,000.

O., Canton—Sinking 5 m.g. well, Grovemiller allotment. $15,000. J. Shisler, City Hall, engr.

Ore., Eugene—Glenwood Water Dist., Eugene, bids soon new water sys. $27,000. WPA.

Pa., Titusville—Chlorinating sys. for water supply sys. Over $15,000. J. M. Fay, city engr.

★**Tex., Amarillo**—A. P. Hancock, city mgr., water facilities. $1,261,680. Applied for FWA funds. W. T. Hazelwood, Amarillo, engr.

Tex., Angelton — C. B. Masterson, mayor, water and sewer facilities addns., disposal plant. $203,571. Applied for FWA funds. C P. Smith, Orange, engr.

Tex., Kingsville—City, c/o Peurifoy & Patterson, engrs. Kingsville, water and sewer imprvs. $89,150 Applied for FWA funds.

Tex., Paris—J M. Crook, mayor, water imprvs. $200,000. Applied for FWA funds. Rollins & Forrest, Praetorian Bldg., Dallas, consult. engrs

Utah, Tooele—Dam to increase water supply. $185,411.

★**†Va., Newport News** — Federal Works Agency, 18 and F Sts. N.W., Wash., D C., plans 30 mi raw water pipe line and pump stations. $2,300,000. Newsom & Aldrich, 500 5th Ave., New York, engrs.

★**†Va., Norfolk and Portsmouth**—Federal Works Agency 18 and F Sts. N.W., Wash., D C., plans 19 mi. concrete pipe line 2 pump stations. $2,177,500. Newsom & Aldrich, 500 5 Ave New York, engrs.

†Wisconsin—U s Eng., Baraboo, water filtration plant, pump station. Greeley & Hansen, 6 N. Michigan Ave., Chicago Ill., engrs

†Wis., Prairie du Sac—City, WW sys. addns., Docket 47-138 $90,074 **FWA.** H. C Amundson, Baraboo, city engr. CD 2/4—ENR 2/12

Ont., Dresden—Municipality, c/o E. J Kyle, new water supply line, etc. $20,000. James, Redfern & Proctor, 36 Toronto St., Toronto, engrs.

Que., Drummondville—J Marier, city clk. exten. filtration plant increasing capacity by 1½ m.g. per day A Roberge, City Hall, associated with A. Plamondon, 369 W. Mount Royal Ave. Montreal, engrs.

Que., Magog—Exten. water and sewer sys. Crepeau & Cote, 45 Wellington St., Sherbrooke, engrs.

Que., St. Foy—WW and sewerage sys. $50,000.

Que., Sherbrooke—S Deslauriers, municipality clk., water supply sys. for annexed suburbs. $60,000. Creapeau & Cote, City Hall, engrs.

BIDS ASKED

Bids Asked May 4

Que., Quebec City—Wartime Housing Ltd., 55 York St., Toronto, Ont., watermains, sewers, etc. St. Malo Ward. $30,000. Engineer, c/o E. O. Ewing, Chateau Salaberry, Valleyfield.

Bids Asked About May 5

★**†R. I., Portsmouth-Middleton** — Federal Works Agency, 18 and F Sts. N. W., Wash., D. C., water sys., 2.5 mi. 20 and 24 in. c.i. or asbestos cement pipeline, 2,700 ft. dam, reservoir, filter plant. $865,000. Charles Maguire & Associates, 1515 Turks Head Bldg., Providence, R. I., engrs.

Bids Asked May 12

Que., Quebec City—F. X. Chouinard, city clk., installing 48 in. rein.-con. watermains under St. Charles River, replacing Aqueduct Bridge. $340,000. E. Hamel, City Hall, engr.

Bids Asked

†Tex., Amarillo—U. S. Eng., Masonic Bldg., water distr. sys. $40,000.

LOW BIDDERS

†Calif., San Diego—City, Apr. 17, Harbor Drive Pipe Line for water sys., Calif. 4-140, Unit 6, Bid 6-RD-104, from Pacific Pipe Line Constr. Co., 8732 Juniper St., Los Angeles, **$71,960**; Chollas Pipe Line, Calif. 4-140, Unit 5, from Amer. Pipe & Constr. Co., 4635 Firestone Blvd., South Gate, **$114,434. FWA.**

†Mich., Center Line—City, Apr. 10, watermains, appurtenances, from Moran & Teetaert Const. Co., 920 Neff St., Detroit. **$29,613. FWA.** CD 4/2—ENR 3/29.

†N. H., Portsmouth—Federal Works Agency, 120 Boylston St., Boston, Mass., Apr. 24, water supply sys., Contr. 1, pipeline, NH 27-1901, from I. Capaldi & Sons, Inc., 278 Silver Spring St., Providence, R. I., **$75,587.** CD 4/20—ENR 4/2.

N. Y., Schenectady—Contr. & Supply Com., City Hall, Apr. 15, 9 wells, from L. I. Water Supply Co., Inc., and Norman F. Harris, Syosset. **$41,685.** CD 3/31—ENR 4/2.

CONTRACTS AWARDED

Conn., Bristol—City, Water Dpt., 119 Riverside Ave., replacing, exten. c.i. watermains. Owner builds. Over **$15,000.** CD 3/20—ENR 3/26.

Ill., East Moline—A. Neihaus, city clk., drilling 1,600 ft. artesian well, to Thorpe Well Co., 2340 6 St., Des Moines, Ia., **$23,729.** Total est. $100,000. Bids 4/20. CD 4/10

La., Patterson—Water filter plant, reservoir, exten. water supply sys., **WPA.** $50,000.

Md., Hagerstown—WW, to Gannett & Banta, Towson, **$42,163.** CD 1/12—ENR 1/15

†Okla., Pryor Creek—City, T. J. Harrison, mayor, waterworks exten., Docket 34-131, Contr. 1, to P. J. Young Constr. Co., St. Joseph, Mo. **$85,903.** Est. $108,000 **FWA.** Bids 4/9. CD 3/5—ENR 4/12.

Ore., Portland—Steel banks on Council Crest also in Burlingame Dist., to The Steel Tank & Pipe Co. of Oregon, 518 N. E. Col. Blvd., **$21,090** and **$17,500** respectively; 13,000 lin. ft. 12 in steel pipe and 750 ft. couplings for mains to Portland Hts. and Burlingame tanks, to Consolidated Supply Co., 139 SW Stark St. **$33,208.** Grand total $72,708. CD 7/31—ENR 8/7.

†Texas—U. S. Eng., Moore Bldg., San Antonio, exten. water supply lines, to Trueheart & Caldwell, Bldrs. Exch. Bldg., San Antonio. **$58,605.** Awarded 4/17. CD 4/16—ENR 4/23.

†Utah—U. S Eng., 32 Exch. Pl., Salt Lake City concrete water tank, to E. S. Faddis, American Fork, **$36,483.** Bids 4/6.

†Utah, Layton—Town, G. E. Briggs, pres., bids soon, water sys. $75,000 **FWA.** Caldwell & Richards, Templeton Bldg., Salt Lake City, engrs.

★**†Va., Newport News** — Federal Works Agency, 18 and F Sts. N.W., Wash., D C., 30 mi. water line, to Lock Joint Pipe Co., P. O. Box 21, Ampere, N. J. **$1,750,000.** Newson & Aldrich, 500 5th Ave., New York, engrs. CD 3/19—ENR 3/26.

Ont., Fort Erie—Fleet Aircraft of Canada, Ltd. 21 Gilmour Rd., 300,000 gal. wood stave tank, concrete fdn., pump house, to Redfern Constr. Co., Ltd., 36 Toronto St., Toronto, **$50,000.** Dpt. Munitions & Supply, Ottawa, Ont., engrs.

Ont., Sault St. Marie—Watermains and domestic connections to new housing development, day labor. **$25,000.** E. Smith, City Hall, engr.

Ont., Toronto—British American Oil Co., Ltd., Royal Bank Bldg water pipeline from lake to plant, to Swansea Constr. Co., Ltd., 1442 Bathurst St. **$25,000.**

Ont., Windsor—Municipality, 16 and 12 in. watermain, day labor, **$25,000.** Utilities Comm., engrs.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Conn., Middletown—S. C. Cannon, supt. P. Wks., City Hall, plans nearing completion, bids soon, sewage plant, sludge beds, pumphouse, Town Farm Property $30,000. Haller Eng. Associates, 410 Asylum St. Hartford, engrs. CD 1/9—ENR 1/15.

†Ga., Macon — Federal Works Agency, 22 Marietta St. Bldg., Atlanta, Ga., incinerator. $80,000.

†La., Bossier (br. Shreveport) — Federal Works Agency, Fort Worth, bids soon sanitary sewer $200,000. R. L. Tatum, 413 Levy Bldg., Shreveport, engr.

†Mich., Pontiac—Oakland County Drain Comr., 1260 West Blvd., sanitary sewers, pump. station, Sects. 1, 2, 3 and 4, Docket Mich. 20-16. **FWA.** Bids 4/13 rejected. Hubbell, Roth & Clark, Inc., 2640 Buhl Bldg., Detroit, Mich., engrs.; adv. ENR 4/30. CD 4/1—ENR 12/25.

Minn., Waseca—Voted $150,000 bonds, sewage disposal plant. CD 3/25—ENR 4/2.

O., Sheffield Lake — Village, W. Insley, mayor, $130,000 bond election, sewerage sys. and sewage disposal plant.

Okla., Oklahoma—R. A. Hefner, mayor, preliminary plans relocating, reconstructing outfall sanitary sewer from Oklahoma Ave. to High St., to replace one which caved in. $28,000. R. Lee, City Hall, engr.

Ore., Milwaukie—Surveys sewage disposal plant.

Ore., Oregon City—Surveys sewage disposal plant. J. L. Franzen, city mgr.

†Pa., Corry—City, addnl. sewers. $70,000. **FWA.** D. Williams, city engr.

Tex., Arcadia Park—Dallas Fresh Water Supply, C & I Dist. 1, c/o C. E. Granger, Dallas, sewer facilities. $85,000. Applied for FWA funds. Myers & Noyes, Tower Petroleum Bldg., Dallas, engrs.

†Tex., Houston—City, C. A. Pickett, mayor, sewer, Contr. 2, Docket 41-207, **FWA.** J. G. Turney, dir. P. Wks. CD 1/30—ENR 2/5.